USEPA ANALYTICAL SERVICES BRANCH (ASB)

STATEMENT OF WORK

FOR

ANALYSIS OF
CHLORINATED BIPHENYL (CB) CONGENERS

Multi-Media, Multi-Concentration

CBC01.0
May 2005

STATEMENT OF WORK

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EXHIBIT A

SUMMARY OF REQUIREMENTS

Exhibit A - Summary of Requirements

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1.0 PURPOSE

The purpose of the multi-media, multi-concentration chlorinated biphenyl (CB) congener analytical service is to provide analytical data for use by the U.S. Environmental Protection Agency, hereafter referred to as USEPA, in support of the investigation and clean-up activities under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and the Superfund Amendments and Reauthorization Act of 1986 (SARA). Other USEPA Program Offices, as well as customers outside the Agency, that have similar analytical data needs also use this service.

2.0 DESCRIPTION OF SERVICE

The CB congener analytical service provides a contractual framework for laboratories to apply USEPA analytical methods for the isolation, detection, and quantitative measurement of chlorinated biphenyl (CB) congeners in water, soil, sediment, sludge, tissue (no human tissue), ash, oil, and oily matrices. The analytical service provides the methods to be used and the specific contractual requirements by which USEPA will evaluate the data. This service uses a High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS) method to analyze the target compounds.

3.0 DATA USES

This analytical service provides data used for a variety of purposes such as: determining the nature and extent of contamination at a hazardous waste site; assessing priorities for response based on risks to human health and the environment; determining appropriate clean-up actions; and determining when remedial actions are complete. The data may be used in all stages in the investigation of hazardous waste sites, including: site inspections; Hazard Ranking System (HRS) scoring; remedial investigation/feasibility studies; remedial design; treatability studies; and removal actions. In addition, this service provides data that are available for use in Superfund enforcement/ litigation activities. The Contractor must be aware of the importance of maintaining the integrity of the data generated under this contract, since it is used to make major decisions regarding public health and environmental welfare.

4.0 SUMMARY OF REQUIREMENTS

4.1 Introduction to the CB Congener Statement of Work (SOW)

The Statement of Work (SOW) is comprised of eight exhibits. Exhibit A provides an overview of the SOW and its general requirements. Exhibit B contains a description of the reporting and deliverables requirements, in addition to the data reporting forms and instructions. Exhibit C specifies the chlorinated biphenyl congeners Target Compound List (TCL) for this SOW with the Contract Required Quantitation Limits (CRQLs) for the sample matrices. Exhibit D details the required analytical procedures to be used with this SOW and resulting contracts. Exhibit E provides descriptions of required Quality Assurance/Quality Control (QA/QC), Standard Operating Procedures (SOPs), QA/QC performance, and the reporting of data. Exhibit F contains chain-of-custody and sample documentation requirements which the Contractor shall follow. To ensure proper understanding of the terms utilized in this SOW, a glossary can be found in Exhibit G. When a term is used in the text without explanation, the glossary meaning shall be applicable. Specifications for reporting data in computer-readable format appear in Exhibit H.

4.2 Overview of Major Task Areas

For each sample, the Contractor shall perform the tasks described in each section. Specific requirements for each task are detailed in the exhibits referenced.

4.2.1 Task I: Sample Receiving, Storage, and Disposal

4.2.1.1 Chain-of-Custody

The Contractor shall receive and maintain samples under proper chain-of-custody. All associated document control and inventory procedures shall be developed and followed. Documentation described herein shall be required to show that all procedures are strictly followed. This documentation shall be reported as the Complete Sample Delivery Group (SDG) File (CSF) (See Exhibit B). The Contractor shall establish and use appropriate procedures to handle confidential information received from USEPA.

4.2.1.2 Sample Scheduling/Shipments

Sample shipments to the Contractor's facility will be scheduled and coordinated by the Task Order Project Officer (TOPO). The Contractor shall communicate with the TOPO by telephone, as necessary, throughout the process of sample scheduling, shipment, analysis, and data reporting, to ensure that samples are properly processed.

4.2.1.2.1 Samples will be shipped routinely to the Contractor through an overnight delivery service. However, as necessary, the Contractor shall be responsible for any handling or processing of the receipt of sample shipments. This includes the pick-up of samples at the nearest servicing airport, bus station, or other carrier within the Contractor's geographical area. The Contractor shall be available to receive sample shipments at any time the delivery service is operating, including weekends.

4.2.1.2.2 If there are problems with the samples (e.g., mixed media, containers broken or leaking) or sample documentation and paperwork (e.g., Chain of Custody Records/Traffic Reports not with shipment, sample and Chain of Custody Record/Traffic Report do not correspond), the Contractor shall immediately contact the TOPO for resolution. The Contractor shall immediately notify the TOPO regarding any problems and laboratory conditions that affect the timeliness of analyses and data reporting. In particular, the Contractor shall immediately notify the TOPO in advance regarding sample data that will be delivered late and shall specify the estimated delivery date.

4.2.1.2.3 To monitor the temperature of the sample shipping cooler more effectively, a sample shipping cooler temperature blank may be included with each cooler shipped. The temperature blank will be clearly labeled: COOLER TEMPERATURE INDICATOR.

4.2.1.2.3.1 When a cooler temperature indicator bottle is included in the sample shipping cooler, the Contractor shall use the supplied cooler temperature indicator bottle to determine the cooler temperature. The temperature of the cooler shall be measured at the time of sample receipt by the Contractor.

4.2.1.2.3.2 The temperature of the sample shipping cooler shall be measured and recorded immediately upon opening the cooler, and prior to unpacking the samples or removing the packing material.

4.2.1.2.3.3 To determine the temperature of the cooler, the Contractor shall locate the cooler temperature indicator bottle in the sample shipping cooler, remove the cap, and insert a calibrated thermometer into the cooler temperature indicator bottle. Prior to recording the temperature, the Contractor shall allow a minimum of 3 minutes, but not greater than 5 minutes, for the thermometer to equilibrate with the liquid in the bottle. At a minimum, the calibrated thermometer (±1°C) shall have a measurable range of 0-50°C. Other devices which can measure temperature may be used if they can be calibrated to ±1°C and have a range of 0-50°C. If a temperature indicator bottle is not present in the cooler, an alternative means of determining cooler temperature shall be used. Under no circumstances shall a thermometer or any other device be inserted into a sample bottle for the purpose of determining cooler temperature. The Contractor shall contact the TOPO and inform them that a temperature indicator bottle was not present in the cooler. The Contractor shall document the alternative technique used to determine cooler temperature in the SDG Narrative.

4.2.1.2.3.4 If the temperature of the sample shipping cooler's temperature indicator exceeds 10°C, the Contractor shall contact the TOPO and inform them of the temperature deviation. The TOPO will either require that no sample analysis(es) be performed or that the Contractor proceed with the analysis(es). The TOPO will provide this decision via Technical Direction in a written format to the Contractor with a copy to the Contracting Officer. For this purpose electronic mail is considered "written" direction. The Contractor shall document the TOPO's decision and the EPA/assigned Sample Numbers of all samples for which temperatures exceeded 10°C in the SDG Narrative.

4.2.1.2.3.5 The Contractor shall record the temperature of the cooler on Form DC-1, under Item 9 - Cooler Temperature, and in the SDG Narrative.

4.2.1.2.4 Reserved.

4.2.1.2.5 The Contractor is required to retain unused sample volume and used sample containers for a period of six (6) months after data submission. From time of receipt until analysis, the Contractor shall maintain all water/aqueous (preserved and unpreserved) and/or soil/sediment samples at less than 6°C, and tissue samples at <-10°C. Store samples in the dark.

4.2.1.2.6 The Contractor shall be required to routinely return sample shipping containers (e.g., coolers) as specified in individual task orders.

4.2.2 Task II: Sample Preparation and Analysis

4.2.2.1 Overview

The Contractor is advised that the samples received under this contract are usually from known or suspected hazardous waste sites

and may contain high levels of organic and inorganic materials of a potentially hazardous nature and of unknown structure and concentration, and should be handled throughout the analysis with appropriate caution. It is the Contractor's responsibility to take all necessary measures to ensure laboratory safety.

4.2.2.2 Sample analyses will be ordered by individual sample or groups of samples. Each order will identify a Case number(s). A Case signifies a group of samples collected at one site or geographical area over a finite time period, and will include one or more field samples with associated blanks. Samples may be shipped to the Contractor in a single shipment or multiple shipments over a period of time, depending on the size of the Case.

4.2.2.2.1 A Case consists of one or more SDGs. The SDG will be defined in individual task orders.

4.2.2.2.2 If Performance Evaluation (PE) samples are received within a Case, they will be assigned to an SDG containing field samples for that Case. Such assignment shall be made at the time the samples are received and shall <u>not</u> be made retroactively.

4.2.2.2.3 Each sample received by the Contractor will be labeled with an EPA/assigned Sample Number and accompanied by a Chain of Custody Record/Traffic Report bearing the Sample Number and descriptive information regarding the sample. The Contractor shall complete and sign the Chain of Custody Record/Traffic Report, recording the date of sample receipt and sample condition on receipt for each sample container.

4.2.2.2.4 The Contractor shall submit signed copies of Chain of Custody Record/Traffic Reports for all samples in an SDG to the TOPO within **three (3) working days** following receipt of the last sample in the SDG. Chain of Custody Records/Traffic Reports shall be submitted in SDG sets (e.g., all Chain of Custody Records/Traffic Reports for an SDG shall be clipped together) with a Chain of Custody Record/Traffic Report Cover Sheet containing information regarding the SDG, as specified in Exhibit B.

4.2.2.2.5 Case numbers, SDG numbers, and EPA/assigned Sample Numbers shall be used by the Contractor in identifying samples received under this contract, both verbally and in reports/ correspondence.

4.2.2.3 Preparation Techniques

The Contractor shall prepare samples as described in Exhibit D.

4.2.2.3.1 If multiphase samples (e.g., a two-phase liquid sample) are received by the Contractor, the Contractor must contact the TOPO to apprise them of the type of sample received. If all phases of the sample are amenable to analysis, the TOPO may require the Contractor to do any of the following through written Technical Direction:

- Mix the sample and analyze an aliquot from the homogenized sample;
- Separate the phases of the sample and analyze each phase individually. The TOPO will assign Sample Numbers for the additional phases;

- Separate the phases and analyze one or more of the phases, but not all of the phases. The TOPO will assign Sample Numbers for the additional phases, if required; or

- Do not analyze the sample.

4.2.2.3.2 If insufficient sample volume (less than the required amount) is received to perform the analysis, the Contractor shall contact the TOPO to apprise them of the problem. The TOPO will either approve that no sample analysis be performed, or require that a reduced volume be used for the sample analysis through written Technical Direction. The Contractor shall document the TOPO's decision in the SDG Narrative.

4.2.2.4 Analytical Techniques

The Target Compounds listed in Exhibit C shall be identified, as described in the methodologies given in Exhibit D. Automated computer programs may be used to facilitate the identification of compounds.

4.2.2.5 Qualitative Verification of Compounds

The chlorinated biphenyl congener compounds identified by High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS) techniques shall be verified by an analyst competent in the interpretation of mass spectra. The analyst will compare the HRGC Retention Time (RT) and ion abundance ratio of two exact m/z's with the corresponding RT of an authentic standard and the theoretical ion abundance ratio of the two exact m/z's.

4.2.2.5.1 If a compound initially identified by HRGC/HRMS techniques cannot be verified, but in the technical judgment of the mass spectral interpretation specialist the identification is correct, the Contractor shall report that identification as an Estimated Maximum Possible Concentration (EMPC) and proceed with quantitation.

4.2.2.6 Quantitation of Verified Compounds

The Contractor shall quantitate components identified by HRGC/HRMS techniques using Selected Ion Current Profile (SICP) areas in one of the methods described in Exhibit D, Section 2.4.

4.2.2.7 QA/QC Procedures

4.2.2.7.1 The Contractor shall strictly adhere to all specific QA/QC procedures prescribed in Exhibits D and E. Records documenting the use of the protocol shall be maintained in accordance with the document control procedures prescribed in Exhibit F, and shall be reported in accordance with Exhibits B and H.

4.2.2.7.2 The Contractor shall maintain a Quality Assurance Plan (QAP) with the objective of providing sound analytical chemical measurements. This program shall incorporate the QC procedures, any necessary corrective action, and all documentation required during data collection, as well as the quality assessment measures performed by management to ensure acceptable data production.

4.2.2.7.3 Additional QC shall be conducted in the form of the analysis of laboratory evaluation samples submitted to the laboratory by

USEPA. Unacceptable results of all such QC or laboratory evaluation samples may be used as the basis for an equitable adjustment to reflect the reduced value of the data to USEPA or rejection of the data for specific analyte(s) within an SDG or the entire SDG. Also, unacceptable results may be used as the basis for contract action. "Compliant performance" is defined as that which yields correct analyte identification and concentration values, as well as meeting the contract requirements for analysis (Exhibit D), QA/QC (Exhibit E), data reporting and other deliverables (Exhibits B and H), and sample custody, sample documentation, and SOP documentation (Exhibit F). As an alternative to data rejection, USEPA may require re-analysis of noncompliant samples. Re-analysis will be performed by the Contractor at no additional cost to USEPA, unless it is determined that the laboratory evaluation sample(s) was defective.

4.2.3 Task III: Sample Reporting and Resubmission of Data

4.2.3.1 Required formats for the reporting of data are found in Exhibits B and H. The Contractor shall be responsible for completing and submitting analysis data sheets and computer-readable data on diskette in a format specified in this SOW and within the time specified in Exhibit B, Section 1.1 or as specified in individual task orders.

4.2.3.2 Use of formats other than those approved by USEPA will be deemed as noncompliant. Such data are unacceptable. Resubmission in the specified format will be required, at no additional cost to USEPA.

4.2.3.3 Computer-generated forms may be submitted in the hardcopy Sample Data Package(s), provided that the forms are in **exact USEPA format**. This means that the order of data elements is the same as on each USEPA-required form, including form numbers and titles, page numbers, and header information.

4.2.3.4 If the submitted data package does not conform to the specified contractual or technical criteria, the Contractor shall resubmit the data package with all deficiencies corrected at its own expense. The Contractor will respond within 7 days to requests for additional information or explanations that result from inspection activities. If the Contractor is required to submit or resubmit data as a result of a request, the data shall be clearly marked as ADDITIONAL DATA. The Contractor shall include a cover letter that describes which data are being delivered, to which project the data pertain, and who requested the data. Any and all resubmissions must be in accordance with the documentation requirements of this SOW.

4.2.3.5 The data reported by the Contractor on the hardcopy data forms and the associated computer-readable data submitted by the Contractor on diskette shall contain identical information. If discrepancies are found during inspection, the Contractor shall resubmit either the hardcopy forms or the computer-readable data, or both sets of data, as requested by USEPA, at no additional cost to USEPA.

4.2.3.6 In addition, the Contractor must be aware of the importance of maintaining the integrity of the data generated under the contract, since it is used to make major decisions regarding public health and environmental welfare. The data may also be used in litigation against Potentially Responsible Parties (PRPs) in the enforcement of Superfund legislation.

EXHIBIT B

REPORTING AND DELIVERABLES REQUIREMENTS

Exhibit B - Reporting and Deliverables Requirements

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1.0 CONTRACT REPORTS/DELIVERABLES DISTRIBUTION

1.1 Report Deliverable Schedule

The following table reiterates the contract reporting and deliverables requirements and specifies the distribution that is required for each deliverable unless revised in individual task orders.

NOTE: Specific recipient names and addresses are subject to change during the term of the contract. The Contracting Officer (CO) will notify the Contractor, in writing, of such changes when they occur.

TABLE 1

Item		No. of Copies[A]	Delivery Schedule	Distribution		
				TOPO	SMO	PO[B]
A.	Sample Chain of Custody Records/Traffic Reports	1	3 working days after receipt of last sample in the SDG[2].	X		
B.[3]	Sample Data Package[C]	2	35 days after VTSR[1] of last sample in the SDG.	X	X	
C.[3]	Data in Computer-Readable Format	1	35 days after VTSR[1] of last sample in the SDG.	X	X	
D.[3]	Results of Intercomparison Study/PE Sample Analysis Study	1	35 days after VTSR[1] of last sample in the SDG.	X		
E.[3,4]	Complete SDG File[3]	1	35 days after VTSR[1] of last sample in the SDG.	X		
F.[5]	Quality Assurance Plan (QAP)	1	Revise within 60 days after contract award. Submit within 7 days of receipt of written request by the PO or CO to recipients, as directed.	As Directed		

TABLE 1 (Con't)

Item		No. of Copies[A]	Delivery Schedule	Distribution		
				TOPO	SMO	PO[B]
G.[5]	Updated Standard Operating Procedures (SOPs)	1	Revise within 60 days after contract award. Submit within 7 days of receipt of written request from the CO or PO to recipients, as directed.	As Directed		
H.	GC/MS Tapes	Lot	Retain for 3 years after data submission. Submit within 7 days after receipt of written request from the CO or PO.	As Directed		
I.	Extracts	Lot	Retain for one (1) year after data submission. Submit within 7 days after receipt of written request by the TOPO, PO or CO.	As Directed		

Footnotes:

[A]The number of copies specified is the number of copies required to be delivered to each recipient.

[B]Project Officer (PO).

[C]Contractor-concurrent delivery to USEPA designated recipient may be required upon request by the PO. Retain for one (1) year after data submission, and submit as directed within 7 days after receipt of written request by the PO or CO.

[1]Validated Time of Sample Receipt (VTSR) is the date of sample receipt at the Contractor's facility, as recorded on the shipper's delivery receipt and sample Chain of Custody Record/Traffic Report.

[2]The Sample Delivery Group (SDG) will be defined in individual task orders.

[3]**DELIVERABLES ARE TO BE REPORTED TOTAL AND COMPLETE**. Concurrent delivery is required. This includes resubmission of both the hardcopy and electronic deliverable. The date of delivery of the SDG, or of any sample within the SDG, is the date all samples have been delivered. **If the**

deliverables are due on a Saturday, Sunday, or Federal holiday, then they shall be delivered on the next business day. Deliverables received after this time shall be considered late.

[4]A complete SDG file will contain the original Sample Data Package, plus all the original documents described in Exhibit B, Section 2.6, and Exhibit E.

[5]See Exhibit E and F for more description; time is cited in calendar days.

1.2 Distribution

The following addresses correspond to the "Distribution" column in Table 1 of Section 1.1.

SMO: USEPA Sample Management Office (SMO)[6]
15000 Conference Center Drive
Chantilly, VA 20151-3808

Task Order Project Officer (TOPO): As identified in individual task orders.

Project Officer (PO):

Mailing Address: USEPA OSRTI Analytical Services Branch
Ariel Rios Building (5204G)
1200 Pennsylvania Avenue, N.W.
Washington, DC 20460
Attn: CB Congener Program Manager/Project Officer

Fed-Ex/Overnight Delivery: USEPA OSRTI Analytical Services Branch
1235 S. Clark Street
Crystal Gateway I, 12th Floor
Arlington, VA 22202
Attn: CB Congener Program Manager/Project Officer

[6]SMO is a Contractor-operated facility operating under the Sample Management Office (SMO) contract awarded and administered by USEPA.

2.0 REPORTING REQUIREMENTS AND ORDER OF DATA DELIVERABLES

2.1 Introduction

The Contractor shall provide reports and other deliverables as specified in the Contract Schedule. The required content and form of each deliverable are described in this exhibit. All reports and documentation must be:

- Legible;
- Clearly labeled and completed in accordance with instructions in this exhibit;
- Arranged in the order specified in this section;
- Paginated sequentially in ascending order starting from the Sample Delivery Group (SDG) Narrative; and
- Copies must be legible and double-sided.
- Information reported on the forms listed in the Exhibit [excluding the Sample Log-In Sheet (CD-1) and the Complete SDG File (CSF) Inventory Sheet (DC-2)] must be either typewritten or computer-generated. Handwritten corrections of the information must be legible, signed, and dated.

  NOTE: Complete SDG Files (CSFs) need not be double-sided. (The CSF is composed of original documents.) However, Sample Data Packages delivered to the Sample Management Office (SMO) must be double-sided.

2.1.1 Requirements for each deliverable item are specified in Sections 2.3 through 2.9. Prior to submission, the Contractor shall arrange items and the components of each item in the order listed in these sections.

2.1.2 The Contractor shall use EPA/assigned Case numbers, SDG numbers, EPA assigned Sample Numbers, and Task Order numbers (if applicable) to identify samples received under this contract, both verbally and electronically and in reports and correspondence. The Contract number and task order number if applicable shall be specified in all correspondence.

2.2 Resubmission of Data

2.2.1 If submitted documentation does not conform to the instructions in this exhibit, the Contractor shall be required to resubmit such documentation with deficiency(ies) corrected at no additional cost to USEPA.

2.2.2 Whenever the Contractor is required to submit or resubmit data as a result of an onsite laboratory evaluation, or through Project Officer (TOPO) action or request, the data must be clearly marked as ADDITIONAL DATA and must be sent to all contractual data recipients as well as designated recipients. A cover letter will be included, by the Contractor describing what data are being delivered, to which project the data pertain, and who requested the data. A copy of the cover letter shall be submitted to the Contracting Officer (CO).

2.3 Quality Assurance (QA) Plan and Standard Operating Procedures (SOPs)

The Contractor shall adhere to the requirements in Exhibits E and F.

2.4 Sample Chain of Custody Records/Traffic Reports

2.4.1 Each sample received by the Contractor shall be labeled with an EPA Sample Number and will be accompanied by a Chain of Custody Record/Sample Traffic Report bearing the Sample Number and descriptive information regarding the sample. The Contractor shall complete the Chain of Custody Record/Traffic Report, recording the date of sample receipt and sample condition upon receipt for each container, and shall sign the Chain of Custody Record/Traffic Report. Information shall be recorded for each sample in the SDG.

2.4.2 The Contractor shall submit Chain of Custody Records/Traffic Reports in SDG sets (i.e., Chain of Custody Records/Traffic Reports for all samples in an SDG shall be clipped together), with a cover sheet attached. The Traffic Report Cover Sheet shall contain the following items:

- Laboratory name;
- Contract number and Task Order number;
- Sample analysis price;
- Case number; and
- List of EPA Sample Numbers of all samples in the SDG, identifying the **first** and **last** samples received, and their Laboratory Receipt Dates (LRDs).

2.4.3 Each Chain of Custody Record/Traffic Report must be clearly marked with the SDG number. This information should be entered below the LRD on the Chain of Custody Record/Traffic Report. In addition, the Chain of Custody Record/Traffic Report for the last sample received in the SDG must be clearly marked "SDG - FINAL SAMPLE". The EPA Sample Number of the first sample received in the SDG is the SDG number. When several samples are received together in the first SDG shipment, the SDG number will be the lowest Sample Number (considering both alpha and numeric designations) in the first group of samples received under the SDG.

2.4.4 If samples are received at the laboratory with multi-sample Chain of Custody Records/Traffic Reports, all the samples on one multi-sample Chain of Custody Record/Traffic Report may not necessarily be in the same SDG. In this instance, the Contractor must make the appropriate number of photocopies of the Chain of Custody Record/Traffic Report and submit one copy with each Chain of Custody Record/Traffic Report Cover Sheet.

2.5 Sample Data Package

The Sample Data Package will include data for analyses of all samples in one SDG, including field samples, dilutions, re-analyses, blanks, and Laboratory Control Samples (LCSs). The Sample Data Package is divided into the three major units [SDG Narrative, Chain of Custody Records/Traffic Reports, and chlorinated biphenyl (CB) congener data] described below. The Contractor will retain a copy of the Sample Data Package for one (1) year after final acceptance of data. After this time, the Contractor may dispose of the package.

2.5.1 SDG Narrative

2.5.1.1 This document will be clearly labeled "SDG Narrative" and will contain: Laboratory name; Case number; EPA Sample Numbers, differentiating between initial analyses and re-analyses; SDG number; Contract number; Task Order number; and detailed documentation of any quality control, samples, shipment and/or analytical problems encountered in processing the samples reported in the data package.

All Gas Chromatograph (GC) columns used for analysis shall be documented in the SDG Narrative. List the GC Column identification: brand-name, internal diameter in mm, and length in meters, coating material, and film thickness.

NOTE: If a column is used that has different first and last eluting isomers than the DB-5 column, the Contractor shall fully document, in the SDG Narrative, the order of elution of the isomers and identify the first and last eluting isomers for that particular column for the Window Defining Mix (WDM) and the Mid-Point Calibration Standard (CS3) Solution.

2.5.1.2 Whenever data from sample re-analyses are submitted, the Contractor shall state the reason in the SDG Narrative for each re-analysis. The Contractor must also include any problems encountered, both technical and administrative, the corrective actions taken and the resolutions, and an explanation for all flagged edits (i.e., manual edits) on quantitation lists. This includes documenting the alternative technique used to determine cooler temperature if a temperature indicator bottle is not present in the cooler. The Contractor shall also provide, in the SDG Narrative, sufficient information including equations or curves to allow the recalculation of sample results from raw instrument output. The Contractor shall also include a discussion of any requested SOW modifications. This includes attaching a copy of the approved modification form to the SDG Narrative.

2.5.1.3 The SDG Narrative shall contain the following statement, verbatim: **"I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or his/her designee, as verified by the following signature."** This statement shall be directly followed by the original signature of the Laboratory Manager or his/her designee with a typed line below it containing the signer's name and title, and the date of signature. All copies of the SDG Narrative shall be signed in an original signature.

2.5.2 Chain of Custody Records/Traffic Reports

2.5.2.1 The Contractor shall include a copy of each Chain of Custody Record/Traffic Report submitted in Section 2.4 for all of the samples in the SDG. The Chain of Custody Records/Traffic Reports shall be arranged in increasing Sample Number order, considering both letters and numbers in ordering samples. Copies of the Chain of Custody Record/Traffic Report Cover Sheet shall be included with the copies of the Chain of Custody Records/Traffic Reports.

2.5.2.2 If samples are received at the laboratory with multi-sample Chain of Custody Records/Traffic Reports, all the samples on one multi-sample Chain of Custody Record/Traffic Report may not necessarily be in the same SDG. In this instance, the Contractor must make the appropriate number of photocopies of the Chain of Custody Record/Traffic Report so that a copy is submitted with each applicable data package.

2.5.2.3 In any instance where samples from more than one multi-sample Chain of Custody Record/Traffic Report are in the same data package, the Contractor must submit a copy of the Chain of Custody Record/Traffic Report Cover Sheet with copies of the Chain of Custody Records/Traffic Reports.

2.5.3 CB Congeners Data

2.5.3.1 CB Congeners Quality Control (QC) Summary

2.5.3.1.1 Method Blank Summary (Form IV CB-1) - in order by EPA Sample Number assigned to the blanks.

2.5.3.1.2 Descriptor Switching Resolution Summary (Form V CB-1) - in order by EPA Sample Number assigned to the Level of Chlorination (LOC)/window-defining congeners mix.

A Descriptor Switching Resolution Summary must be completed for each 12-hour period. The RT for the first and last eluting congener at each level of chlorination are included on this form.

2.5.3.1.3 Ion Abundance Ratio Summary (Form V CB-2, CB-3) - in order by EPA Sample Number assigned to the LOC/window-defining congeners mix.

Ion Abundance Ratio Summaries for both native and labeled congeners must be completed for each 12-hour period.

2.5.3.2 CB Congeners Sample Data. Sample data shall be arranged in packets with the Toxic CB Congener Sample Data Summary (Form I CB-1), Toxic CB Congener Toxicity Equivalence Summary (Form I CB-2), and CB Congener Sample Data Summary (Form I CB-3) followed by the raw data for CB congener samples. These sample packets should then be placed in order of increasing EPA Sample Number, considering both letters and numbers.

2.5.3.2.1 Toxic Congener Results, Toxic CB Congener Sample Data Summary (Form I CB-1). Tabulated results (identification and quantitation) of the specified target compounds (Exhibit C - CB Congeners) and recoveries of their associated labeled compounds shall be included. The validation and release of these results is authorized by a specific, signed statement in the SDG Narrative (Section 2.5.1.3). In the event that the Laboratory Manager cannot verify all data reported for each sample, the Laboratory Manager shall provide a detailed description of the problems associated with the sample in the SDG Narrative.

2.5.3.2.2 Toxic CB Congener Toxicity Equivalence Summary (Form I CB-2). Tabulated adjusted concentrations for the target compounds based on the Toxicity Equivalence Factor (TEF). This form shall be included even if no target compounds are positively identified.

2.5.3.2.3 CB Congener Sample Data Summary (Form I CB-3). Tabulated results for non-toxic congeners if this analysis is requested by the USEPA Region.

2.5.3.2.4 The SICP for each sample or sample extract, including dilutions and reanalyses.

SICPs must be presented so the two quantitation ions, and the relevant labeled compounds, are on one page. The internal standards can be presented on another page. The SICP must show the full time window scanned for each ion. The SICP for any toxic congener below the Signal-to-Noise (S/N) ratio of 10 or below the CRQL must be enlarged. Each SICP must include the following header information:

- EPA Sample Number;
- Date and time of analysis;
- Absolute RT (and scan number if available) of identified compounds;
- High Resolution Gas Chromatograph/High Resolution Mass Spectrometer (HRGC/HRMS) Instrument ID;
- Lab File ID; and
- Analyst ID.

2.5.3.2.5 If automated data system procedures are used for preliminary identification and/or quantitation of the target compounds, the complete data system report, including but not limited to quantitation reports and area summaries, shall be provided in all Sample Data Packages, in addition to the SICPs. The complete data system report shall include all of the information listed below. For laboratories which do not use the automated data system procedures, a laboratory "raw data sheet" containing the following information shall be included in the Sample Data Package, in addition to the SICP:

- EPA Sample number;
- Date and time of analysis;
- Absolute RT (and scan number if available) of identified compounds;
- Ions used for quantitation with measured areas;
- Copy of area table from data system;
- On column concentration/amount including units;
- HRGC/HRMS Instrument ID;
- Lab File ID; and
- Analyst ID.

2.5.3.2.6 In all instances where the data system report has been edited, or where manual integration or quantitation has been performed, the HRGC/HRMS Operator shall identify such edits or manual

procedures made to the report, by initialing and dating all handwritten changes, and shall include the integration scan range. In addition, a hardcopy printout of the chromatogram displaying the manual integration shall be included in the raw data.

2.5.3.2.7 CB Congener Total Homologue Concentration Summary (Form II CB-1). Tabulated total homologue shall be completed for each sample and blank analyzed.

2.5.3.3 CB Congeners Standards Data

2.5.3.3.1 Initial Calibration of CB Congeners (Form VI CB-1, CB-2, CB-3) - in order by instrument, if more than one instrument is used.

2.5.3.3.1.1 Perfluorokerosene (PFK) mass resolution for initial calibration shall be provided and labeled with EPA Sample Number, date and time, HRGC/HRMS Instrument ID, Lab File ID, and Analyst ID.

2.5.3.3.1.2 Standards, SICPs, and complete data system reports for the initial (five- or six-point) calibration for the toxic CB congeners will be labeled as stated in Sections 2.5.3.2.4 and 2.5.3.2.5.

2.5.3.3.1.3 If analysis of the non-toxic CB congeners is requested, the standards, SICPs, and data system reports for the single-point calibration shall be present.

2.5.3.3.1.4 When more than one initial calibration is performed, the data must be arranged in chronological order by instrument.

2.5.3.3.2 Continuing Calibration Verification Data (Form VII CB-1, CB-2, CB-3, CB-4, CB-5, CB-6) - in order by instrument, if more than one instrument is used.

2.5.3.3.2.1 PFK mass resolution for CCV shall be provided for each 12-hour period and labeled with EPA Sample Number, date and time, HRGC/HRMS Instrument ID, Lab File ID, and Analyst ID.

2.5.3.3.2.2 Standards, SICPs, and complete data system reports including area summaries for all CCVs will be labeled as specified in Sections 2.5.3.2.4 and 2.5.3.2.5.

2.5.3.3.2.3 If analysis of non-toxic CB congeners is requested, the SICPs and data system reports for the diluted 209-congener solution(s) shall be present.

2.5.3.3.2.4 When more than one CCV is performed, the data must be arranged in chronological order by instrument.

2.5.3.3.2.5 In all instances where the data system report has been edited, or where manual integration or quantitation has been performed, the HRGC/HRMS operator shall identify the changes made to the report, by initialing and dating all handwritten changes, and shall include the integration scan range. In addition, a hardcopy printout of the chromatogram of the quantitation ion(s) displaying the manual integration shall be included in the raw data. This applies to all target compounds listed in Exhibit C, labeled compounds, and internal standards.

2.5.3.3.2.6 Analytical Sequence (Form VIII CB) - for all GC columns and instruments, in chronological order by GC column and instrument.

2.5.3.4 CB Congeners Raw Quality Control (QC) Data

2.5.3.4.1 Blank data shall be included in order by EPA Sample Number assigned to the blank.

- Form I CB-1, CB-2, and CB-3.
- SICPs and complete data system reports including area summaries shall be submitted for each blank analyzed, and labeled as specified in Sections 2.5.3.2.4 and 2.5.3.2.5.

2.6 Complete Sample Delivery Group (SDG) File (CSF)

2.6.1 A CSF, including the original Sample Data Package, shall be delivered to the SMO concurrently with delivery of the Sample Data Package to the TOPO. The contents of the CSF shall be numbered according to the specifications described in Section 3.6. The CSF shall contain all original documents specified in Sections 3 and 4, and in Form DC-2. No copies shall be placed in the CSF unless the originals were initially written in a bound notebook maintained by the laboratory, or the originals were previously submitted to USEPA with another SDG in accordance with the requirements described in Exhibit F.

2.6.2 The CSF shall consist of the following original documents, in addition to the documents in the Sample Data Package:

- Original Sample Data Package;
- A completed and signed CB CSF Inventory Sheet (Form DC-2);
- All original shipping documents including, but not limited to, the following:
  - Chain of Custody Records/Traffic Reports;
  - Airbills (if an airbill is not received, include a hardcopy receipt from the shipping company or a printout of the shipping company's electronic tracking information); and
  - Sample tags (if present) sealed in plastic bags.
- All original receiving documents including, but not limited to, the following:
  - Form DC-1;
  - Other receiving forms or copies of receiving logbooks, and
  - Chain of Custody Record/Traffic Report Cover Sheet.
- All original laboratory records not already submitted in the Sample Data Package of sample transfer, preparation, and analysis including, but not limited to, the following documents:
  - Original preparation and analysis forms or copies of preparation and analysis logbook pages;
  - Internal sample and sample extract transfer Chain of Custody Records;
  - Screening records; and
  - All instrument output, including strip charts from screening activities.

- All other original SDG-specific documents in the possession of the Contractor, including, but not limited to, the following documents:

  - Telephone contact logs;
  - Copies of personal logbook pages;
  - All hand-written SDG-specific notes; and
  - Any other SDG-specific documents not covered by the above.

NOTE: All Case-related documentation may be used or admitted as evidence in subsequent legal proceedings. Any other SDG-specific documents generated after the CSF are sent to the TOPO, as well as copies that are altered in any fashion, are also deliverables to USEPA (original to the TOPO and copies to SMO).

2.6.3 If the Contractor does submit SDG-specific documents to USEPA after submission of the CSF, the documents shall be identified with unique accountable numbers, a revised Form DC-2 shall be submitted, and the unique accountable numbers and locations of the documents in the CSF shall be recorded in the "Other Records" section on the revised Form DC-2. Alternatively, the Contractor may number the newly submitted SDG-specific documents to USEPA as a new CSF and submit a new Form DC-2. The revised Form DC-2 or new Form DC-2 should be submitted to the TOPO only.

2.7 Electronic Data Deliverable

The Contractor shall provide an electronic data deliverable on analytical data for all samples in the SDG, as specified in Exhibit H, and delivered as specified in the Contract Schedule (Performance/Delivery Schedule), if required.

2.8 Delivery of Hardcopy Data in PDF Format

In addition to all required deliverables identified in the laboratory's contract and the CBC01.0 SOW, the laboratory shall provide a complete copy of the hardcopy deliverable in PDF on a Compact Disc (CD).

2.8.1 The PDF file should be organized in accordance to directions provided in Exhibit B, "Reporting Requirements and Order of Data Deliverables" of the CBC01.0 SOW. The PDF file shall be bookmarked as described in the following table for ease of data retrieval and navigation.

TABLE 2

Group Bookmark	Parent Bookmark	Child Bookmarks
Sample TR/COCs, TR/COC Cover Sheet, and SDG Narrative		
CB Congener	Sample Data	Samples in increasing alphanumeric EPA Sample Number order, Form Is, Form II (with supporting raw data)
	QC Summary	Method Blank (with supporting data)
		Laboratory Control Sample (with supporting raw data)
	Standard Data	PFK Tune Report
		Resolution Summary(with supporting raw data)
		Initial Calibration data (with supporting raw data)
		Continuing Calibration Verification Data, including closing CCV (with supporting raw data)
		Analytical Sequence
Miscellaneous		DC-1 and DC-2 Forms, logbook information, Sample Extraction log, % solid/lipid, GPC/column cleanup, instrument conditions, sample tags, etc.

2.8.2 When submitting the file to USEPA, the following materials shall be delivered in response to the request:

- All associated raw data files for samples, blanks, QC samples, LCSs, and initial and continuing calibration standards;
- All processed data files and quantitation output files associated with the raw data files described above;
- All associated identifications and calculation files used to generate the data submitted in the data package; and
- A copy of the Contractor's written reference logbook relating tape files to Sample Number, calibration data, standards, blanks, and LCSs. The logbook shall include Sample Numbers and laboratory file identifiers for all samples, blanks, and standards, identified by Case and SDG.

2.8.3 The laboratory shall also provide a statement attesting to the completeness of the HRGC/HRMS data tape submission, signed and dated by the Laboratory Manager and/or designee. This statement shall be part of a cover sheet that includes the following information relevant to the magnetic media submission:

- Laboratory name;
- Date of submission;

- Case number;
- Task Order number;
- SDG number;
- HRGC/HRMS make and model number;
- Software version;
- Disk drive type (e.g., CDC, PRIAM);
- File transfer method [e.g., Document Structure Definition (DSD), Document Type Definition (DTD), File Transfer Protocol (FTP), Aquarius]; and
- Names and telephone numbers of two laboratory contacts for further information regarding the submission.

2.9 Extracts

2.9.1 The Contractor shall store sample extracts in the dark at less -10° in bottles/vials with polytetrafluoroethylene (PTFE)-lined septa. Extract bottles/vials shall be labeled with the EPA Sample Number, Case number, SDG number, and Task Order number. A logbook of stored extracts, listing EPA Sample Numbers and associated Case and SDG numbers, shall be maintained.

2.9.2 The Contractor is required to retain extracts for one (1) year following submission of reconciled complete data package. During that time, the Contractor shall submit extracts and associated logbook pages within 7 days following receipt of a written request from the TOPO or CO.

3.0 GENERAL FORM INSTRUCTIONS

3.1 Introduction

This section contains general instructions for completion of all required chlorinated biphenyl (CB) congeners Data Reporting Forms.

3.2 General Information

3.2.1 The data reporting forms presented in Exhibit B, Section 4.0, have been designed in conjunction with the computer-readable data formats specified in Exhibit H, "Data Dictionary and Format for Data Deliverables in Computer-Readable Format". The specific length of each variable for computer-readable data transmission purposes is given in Exhibit H. Information entered on these forms shall **not** exceed the size of the field given on the form, including such laboratory generated items as "LAB NAME" and "LAB SAMPLE ID".

NOTE: On the hardcopy forms, the space provided for entries is greater in some instances than the length prescribed for the variable as written to the electronic deliverable (see Exhibit H). Greater space is provided on the hardcopy forms for visual clarity.

3.2.2 All characters which appear on the data reporting forms presented in Section 4 must be reproduced by the Contractor when submitting data, and the format of the forms submitted must be identical to that shown in the contract. No information may be added, deleted, or moved from its specified position without prior written approval of the Project Officer (PO). The names of the various fields and compounds (e.g., "LAB CODE", "2378-TCDD") must appear as they do on the forms in the contract, including the options specified in the form (i.e., "MATRIX: (SOIL/WATER/ASH/TISSUE/OIL)" must appear, not just "MATRIX"). For items appearing on the uncompleted forms (Section 4), the use of uppercase and lowercase letters is optional.

3.2.3 Alphabetic entries made onto the forms by the Contractor shall be in ALL UPPERCASE letters (e.g., "SOIL", not "Soil" or "soil"). If an entry does not fill the entire blank space provided on the form, null characters shall be used to remove the remaining underscores that comprise the blank line.

3.3 Header Information

Six pieces of information are common to the header section of each data reporting form. They are Lab Name, Contract, Lab Code, Case No., Task Order No., and SDG No. Except as noted below for Task Order No., this information must be entered on every form and must match on every form.

3.3.1 "LAB NAME" will be the name chosen by the Contractor to identify the laboratory. It may not exceed 25 characters.

3.3.2 "LAB CODE" is an alphanumeric abbreviation of up to six letters and numbers assigned by USEPA to identify the laboratory and aid in data processing. This lab code will be assigned by USEPA at the time a contract is awarded and shall not be modified by the Contractor, except at the direction of the Contracting Officer (CO). If a change of name or ownership occurs at the laboratory, the lab code will remain the same unless and until the Contractor is directed by the CO to use another USEPA-assigned lab code.

3.3.3 "CASE NO." is the assigned Case number associated with the sample and reported on the Chain of Custody Record/Traffic Report or sample shipping paperwork.

3.3.4 "CONTRACT" is the number of the contract under which the analyses were performed.

3.3.5 "SDG NO." is the EPA Sample Number of the first sample received in the Sample Delivery Group (SDG). When several samples are received together in the first SDG shipment, the SDG number shall be the lowest Sample Number (considering both alpha and numeric designations) in the first group of samples received under the SDG.

3.3.6 The "TO NO." is the Task Order number under which the analyses were performed.

3.3.7 The "SAMPLE NO." is the EPA Sample Number provided by USEPA and is the other information common to most of the forms. This number appears either in the upper right-hand corner of the form, or as the left column of a table summarizing data from a number of samples.

3.3.7.1 All samples, Laboratory Control Samples (LCSs), blanks, and standards shall be identified with an EPA Sample Number. For field samples, the EPA Sample Number is based on the unique identifying number given in the Chain of Custody Record/Traffic Report or sample shipping records for that sample.

3.3.7.2 In order to facilitate data assessment, the following suffixes must be used:

XXXXX = EPA Sample Number
XXXXXRE = Re-extracted and re-analyzed aliquot of sample "XXXXX"
XXXXXDL = Diluted analysis of sample "XXXXX"
XXXXXS = Filtered solid in aqueous samples containing greater than 1% solid. The aqueous filtrate belonging to this sample will be named "XXXXX"

3.3.7.3 For blanks and standards, the following identification scheme must be used as the "Sample No.":

- The CB Congener Method blanks shall be identified as CBLK##;
- Calibration standards shall be identified as CS1##, CS2##, CS3##, CS4##, and CS5##, and shall correspond to the calibration solutions identified in Exhibit D;
- The Window Defining Mixture (WDM) shall be identified as WDM##;
- The Isomer Specificity Check (ISC) shall be identified as ISC##;
- If combined, the WDM and ISC shall be identified as CPS##;
- The LCS shall be identified as CLCS##; and
- The perfluorokerosene (PFK) mass resolution check shall be identified as PFK##.

3.3.7.4 "SAMPLE NO." must be unique within an SDG. Therefore, the Contractor must replace the two-character "##" terminator of the identifier with one or two characters or numbers, or a combination

of both, to create a unique Sample Number for each blank and standard within the SDG. For example, possible identifiers for method blanks would be CBLK01, CBLK02, CBLKA1, CBLKB2, CBLKAB, etc.

3.3.8 Other Common Fields

Other pieces of information are common to many of the data reporting forms. These include "MATRIX", "LAB SAMPLE ID", "LAB FILE ID", "INSTRUMENT ID", and "GC COLUMN".

3.3.8.1 For "MATRIX", enter "SOIL" for a soil/sediment/sludge sample, "WATER" for an aqueous sample, "TISSUE" for tissue, "OIL" for oil and oil matrix, and "ASH" for fly ash samples.

3.3.8.2 "LAB SAMPLE ID" is an optional laboratory generated internal identifier. Up to 12 alphanumeric characters may be reported here. If the Contractor does not have a Lab Sample ID, this field may be left blank. However, if this identifier is used on <u>any</u> of the forms <u>or</u> accompanying hardcopy data deliverables, it must be reported on <u>all</u> the appropriate forms.

3.3.8.3 "LAB FILE ID" is the laboratory generated name of the High Resolution Gas Chromatography/High Resolution Mass Spectrometry (HRGC/HRMS) data system file containing information pertaining to a particular analysis. Up to 14 alphanumeric characters may be used here.

3.3.8.4 "INSTRUMENT ID" is common to many of the forms, particularly those containing calibration data. The identifier used by the laboratory must include some indication of the manufacturer and/or model of the instrument, and contain additional characters or numbers that differentiate between all instruments of the same type in the laboratory. The instrument identifier must be consistent on all forms within the SDG.

3.3.8.5 "GC COLUMN" and "ID (mm)" are common to various other forms. These two fields are to be used to identify the stationary phase of the GC column, and the internal diameter of the GC column in millimeters (mm).

3.3.9 Rounding Rule

For rounding off numbers to the appropriate level of precision, observe the following common rules. If the figure following those to be retained is less than 5, drop it (round down). If the figure is greater than or equal to 5, drop it and increase the last digit to be retained by 1 (round up).

3.4 CB Congener Data Reporting Forms

3.4.1 Toxic CB Congener Sample Data Summary (Form 1 CB-1)

3.4.1.1 Purpose

This form is used for tabulating and reporting sample analysis, including dilutions, reanalysis, blank, LCS, and requested Matrix Spike and Matrix Spike Duplicate results for target compounds.

3.4.1.2 Instructions

Complete the header information according to the instructions in Section 3.3. Complete the remainder of the form using the following instructions.

3.4.1.2 For soil and sediment samples analyzed for CB congeners, enter the values for the Percent Moisture determined during the analysis in the "% SOLIDS/LIPIDS" field on Form I CB-1. In the "DECANTED: (Y/N)" field, enter Y if the sample had standing water above the soil or sediment that was decanted, or N if no water was decanted off the surface of the sample. For water samples analyzed for CB congeners, enter the Percent Solids on Form I CB-1. For tissue samples analyzed for CB congeners, enter the Percent Lipids on Form I CB-1. All tissue results must be reported on a wet weight basis. Report Percent Moisture, Percent Solids, and Percent Lipids (decanted or not decanted) to the nearest whole percentage point (e.g., 5%, not 5.3%). For water samples, method blanks, and instrument blanks, leave these fields blank on Form I.

3.4.1.3 Enter the method of extraction in the "EXTRACTION: (TYPE)" field on Form I CB-1, as SEPF for separatory funnel, CONT for continuous liquid-liquid extraction without hydrophobic membrane, CONH for continuous liquid-liquid extraction with hydrophobic membrane, SPE for Solid Phase Extraction, SOXH for Soxhlet Extraction (soils or tissues), SDS for Soxhlet-Dean Stark extraction (CB congeners soils only), or PFEX for Pressurized Fluid Extraction (soils only).

3.4.1.4 Enter the cleanup method used [Acid, Base, GPC, Silica, Florisil, HPLC, carbon, or Anthropogenic Isolation Column (AIC] in the "CLEANUP: (TYPE)" field.

3.4.1.5 Enter the date of sample receipt at the laboratory, as Noted on the TR/Chain of Custody Record [i.e., the Validated Time of Sample Receipt (VTSR)], in the "DATE RECEIVED" field. The date shall be entered as MM/DD/YYYY.

3.4.1.6 Complete the "DATE EXTRACTED" and "DATE ANALYZED" fields in the same format (MM/DD/YYYY). When continuous liquid-liquid extraction procedures are used for water samples, enter the date that the procedure was **started** in the "DATE EXTRACTED" field. If separatory funnel, SPE, sonication, soxhlet, SDS, or pressurized fluid procedures are used, enter the date that the procedure was **completed** in the "DATE EXTRACTED" field. The date of sample receipt will be compared with the extraction and analysis dates of each sample to ensure that contract holding times were not exceeded.

3.4.1.7 Enter the actual volume of the **most** concentrated sample extract, in µL, in the "CONCENTRATED EXTRACT VOLUME" field on Form I CB-1.

If a dilution of the sample extract is made in a subsequent analysis, this volume will remain the same, but the Dilution Factor (DF) will change. For CB congeners, this volume will typically be 20 µL.

3.4.1.8 Enter the volume of the sample extract injected into the GC in the "INJECTION VOLUME" field on Form I CB-1. Report this volume in µL to one decimal place (e.g., 1.0 µL).

3.4.1.9 If a sample or sample extract has been diluted for analysis, enter the DF value to one decimal place in the "DILUTION FACTOR" field (i.e., a DF of 1 will be reported as 1.0; DF of 10 will be reported as 10.0).

3.4.1.10 For positively identified target compounds, the Contractor shall report the concentrations as **uncorrected** for blank contaminants.

3.4.1.11 Report all analytical results to two significant figures if the value is less than 10.

3.4.1.12 Enter the appropriate concentration units, pg/L or ng/kg in the field from "CONCENTRATION UNITS".

NOTE: Tissue results must be reported on a wet weight basis.

3.4.1.13 For reporting results, the following contract-specific qualifiers are to be used. The seven qualifiers listed below <u>are</u> <u>not</u> subject to modification by the laboratory. Up to five qualifiers may be reported on Form I for each analyte. The seven defined qualifiers to be used are as follows:

3.4.1.13.1 U - Indicates compound was analyzed for, but not detected. The "CONCENTRATION" column is left blank in this instance, and an Estimated Detection Limit (EDL) must be calculated based on the signal-to-noise (S/N) ratio, as described in Exhibit D. This calculation takes into account the sample weight/volume extracted, the volume of the most concentrated extract, the injection volume, and dilution of the most concentrated extract prior to analysis.

3.4.1.13.2 J - Indicates an estimated value. This flag is used when the mass spectral data indicate the presence of an analyte meeting all the identification criteria in Exhibit D, but the result is less than the Contract Required Quantitation Limit (CRQL), as listed in Exhibit C, but greater than zero.

3.4.1.13.3 B - This flag is used when the analyte is found in the associated blank, as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action.

3.4.1.13.4 E - This flag identifies analytes whose concentrations exceed the calibration range of the HRGC/HRMS instrument for that specific analysis. If one or more compounds have a response greater than fullscale, except as noted in Exhibit D, a smaller sample size must be extracted and analyzed according to the specifications in Exhibit D. All such compounds with a response greater than full scale should have the concentration flagged "E" on the Form I for the original analysis. If the dilution causes any compounds identified in the first analysis to be below the calibration range in the second analysis, the

results of both analyses shall be reported on separate copies of Form I. The Form I for the diluted sample shall have the "DL" suffix appended to the EPA Sample Number.

3.4.1.13.5 D - This flag indicates all compounds identified in an analysis at a secondary dilution factor. If a smaller sample size is analyzed, as in the "E" flag above, the "DL" suffix is appended to the EPA Sample Number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with the "D" flag. This flag alerts data users that any discrepancies between the concentrations reported may be due to dilution of the sample extract.

3.4.1.13.6 H - This flag indicates that the analyte in question was quantitated using peak heights rather than peak areas for both the analyte and its internal standard (see Exhibit D, Section 11).

3.4.1.13.7 X - Other specific flags may be required to properly define the results. If used, they must be fully described, and such description must be attached to the Sample Data Package and the SDG Narrative. Begin using "X". If more than one flag is needed, use "Y" and "Z" as needed. The laboratory-defined flags are limited to the letters "X", "Y", and "Z".

3.4.2 Toxic CB Congener Toxicity Equivalence Summary (Form I CB-2)

3.4.2.1 Purpose

This form is used to report the Toxicity Equivalence Factor (TEF)-adjusted concentrations and the Total TEF-adjusted concentration for the toxic congeners for samples. The contractor shall submit a Form I CB-2 for each sample.

3.4.2.2 Instructions

Complete the header information according to the instructions in Section 3.3. Complete the remainder of the fields in the header according to the instructions in Section 3.4.1. Complete the remainder of the form using the following instructions:

3.4.2.2.1 For each toxic congener result greater than the CRQL, enter the concentration in the "CONCENTRATION" column. Otherwise, leave the field blank.

3.4.2.2.2 For each toxic congener result greater than the CRQL, calculate the TEF-adjusted concentration by multiplying the result by the TEF and enter the calculated value in the "TEF-Adjusted Concentration" column. Otherwise leave the field blank.

3.4.2.2.3 Calculate the Total TEF-adjusted concentration and enter the calculated total in the "TEF" field.

3.4.3 CB Congener Sample Data Summary (Form I CB-3)

3.4.3.1 Purpose

This form is used for tabulating and reporting sample analysis, including dilutions, reanalyses, and blanks, for the non-toxic CB congeners when analysis for these congeners is requested by a USEPA Region.

3.4.3.2 Instructions

Complete the header information according to the instructions in Sections 3.3. Complete the remainder of the fields in the header according to the instructions in Section 3.4.1. Complete the remainder of the form using the following instructions:

3.4.3.2.1 Under the column labeled "TARGET ANALYTE", enter the congener ID number as described in Exhibit D - CB Congeners.

3.4.3.2.2 Under the column labeled "CONCENTRATION", report the results to two significant figures.

3.4.3.2.3 Under the column labeled "Q", flag each result with the specific data reporting qualifiers described in Section 3.4.1.13.

3.4.4 CB Congener Total Homologue Concentration Summary (Form II CB-1)

3.4.4.1 Purpose

This form is used to report the concentration of the mono- through nona-chloro biphenyl homologues for each sample.

3.4.4.2 Instructions

Complete the header information according to the instructions in Sections 3.3 and 3.4.1. Complete the remainder of the form using the following instructions.

3.4.4.2.1 Under the column labeled "PEAKS", enter the number of congener peaks detected for each homologue. If no peaks are detected leave the field blank.

3.4.4.2.2 Under the column labeled "CONCENTRATION", report the total concentration for the homologue to two significant figures. If no concentration is found, leave the field blank.

3.4.4.2.3 Under the column labeled "Q", flag each total homologue result with the specific data reporting qualifiers described in Section 3.4.1.13.

3.4.5 Method Blank Summary (Form IV CB-1)

3.4.5.1 Purpose

This form summarizes the samples associated with each method blank analysis. The Contractor shall submit the appropriate Form IV for each blank.

3.4.5.2 Instructions

Complete the header information according to the instructions in Section 3.3. The EPA Sample Number entered in the upper right-hand corner shall be the same number entered on Form I for the blank. Complete the remainder of the form using the following instructions.

3.4.5.2.1 Complete the following fields: "INSTRUMENT ID", "DATE ANALYZED", and "TIME ANALYZED". Dates shall be entered as MM/DD/YYYY. The time shall be reported in military time.

3.4.5.2.2 Identify the GC column and internal diameter in the appropriate fields.

3.4.5.2.3 For CB congener blanks, enter the method of extraction as CONH for continuous liquid-liquid extraction with hydrophobic membrane, CONT for continuous liquid-liquid extraction without hydrophobic membrane, SOXH for Soxhlet extraction, or PFEX for pressurized fluid extraction on Form IV CB. For CB congener blanks, separatory funnel extraction shall be entered as SEPF. For CB congener blanks, Solid Phase Extraction shall be entered as SPE and Soxhlet-Dean Stark extraction (tissue only) shall be entered as SDS.

3.4.5.2.4 For CB congener method blanks, enter the date of extraction of the blank on Form IV CB.

3.4.5.2.5 Enter the reference matrix used to prepare the method blank in the "MATRIX" field.

3.4.5.2.6 CB Congeners method blanks require the identical cleanup methods as the associated samples. If any cleanup methods are employed, enter them in the "CLEANUP: (TYPE)" field.

3.4.5.2.7 As appropriate, summarize the samples including LCSs, requested MS/MSDs, storage blanks, and volatile instrument blanks, associated with a given method blank in the table, entering the EPA Sample Number and Laboratory Sample Identifier. For CB congeners, enter the Laboratory File Identifier and the date of analysis.

3.4.5.2.8 Number all pages as described in Section 3.3.

3.4.6 Descriptor Switching Resolution Summary (Form V CB-1)

3.4.6.1 Purpose

This form is used to report the descriptor switching windows for each level of chlorination for each 12-hour time period and to summarize the date and time of analyses of samples, including dilutions, reanalyses, standards, blanks, and requested MS/MSDs associated with each analysis of the Instrument Performance Check solution.

3.4.6.2 Instructions

Complete the header information according to the instructions in Section 3.3. Complete the remainder of the form using the following instructions.

3.4.6.2.1 Enter the date and time of the analysis (defined at time of injection) of the Level Of Chlorination (LOC)/Window-Defining Mixture (WDM). The date shall be entered as MM/DD/YYYY. The time shall be reported as military time.

3.4.6.2.2 Enter the GC column and internal diameter.

3.4.6.2.3 Enter the RT of the first eluting congener and the last eluting congener for each LOC. Report the RT in minutes. Seconds are to be reported as a decimal value of a whole minute (e.g., 21 min., 20 sec. is reported as 21.33).

3.4.7 Ion Abundance Ratio Summary (Form V CB-2, CB-3)

3.4.7.1 Purpose

These forms are used to report the ion abundance ratios and Signal-to-Noise (S/N) ratios for the congeners contained in the LOC/WDM for each 12-hour time period.

3.4.7.2 Instructions

Complete the header information according to the instructions in Section 3.3. Complete the remainder of the form using the following instructions.

3.4.7.2.1 Enter the date and time of the analysis of the LOC/WDM. The date shall be entered as MM/DD/YYYY. The time shall be reported as military time.

3.4.7.2.2 Enter the GC column and internal diameter.

3.4.7.2.3 Enter the ion abundance ratio and the S/N for each of the congeners/labeled congeners present in the mixture. Flag all data outside the QC limits.

3.4.8 Initial Calibration Data (Form VI CB-1, CB-2, CB-3)

3.4.8.1 Purpose

After a High Resolution Gas Chromatograph/High Resolution Mass Spectrometer (HRGC/HRMS) system has undergone an initial five or six-point calibration at the specific concentration levels described in Exhibit D, and after all initial calibration criteria have been met, the Contractor shall complete and submit these forms for each toxic/LOC CB congener initial calibration performed that is relevant to the samples, including dilutions, reanalyses, and blanks, regardless of when that calibration was performed. If a HRGC/HRMS system has undergone a single calibration for all native congeners at the specific concentration levels described in Exhibit D, and after all initial calibration criteria have been met, the Contractor shall complete and submit these forms for each native CB congener initial calibration performed that is relevant to the samples, including dilutions, reanalyses, and blanks, regardless of when the calibration was performed.

3.4.8.2 Instructions

Complete the header information according to the instructions in Section 3.3. Enter the Case Number and the SDG Number for the current data package, regardless of the original Case for which the initial calibration was performed. Complete the remainder of the form using the following instructions.

3.4.8.2.1 Enter the date(s) of the initial calibration in the "INIT. CALIB. DATE(S)" field. If the calendar date changes during the calibration procedure, the inclusive dates shall be recorded. Dates shall be entered as MM/DD/YYYY.

3.4.8.2.2 Enter the injection times of the first and last of the standards analyzed in the "INIT. CALIB. TIME(S)" field. Times shall be reported in military time.

3.4.8.2.3 Complete the "GC COLUMN" and "ID" fields.

3.4.8.2.4 Complete the Relative Response (RR) and RRF data and the Ion Abundance Ratio data for the five (or six) calibration points. Calculate and report the Mean RR ($\overline{RR}$) or $\overline{RRF}$, RRT, and Percent Relative Standard Deviation (%RSD) for all toxic/LOC congeners, labeled compounds, cleanup standards, and internal standards in the calibration standards. See Exhibit D for equations. Report the QC Limits. For individual congeners, complete the RRF, RRT, and the Ion Abundance Ratio data for the single calibration point.

3.4.9 Continuing Calibration Verification Data (Form VII CB-1, CB-2, CB-3, CB-4, CB-5, CB-6)

3.4.9.1 Purpose

Form VII is used to report the calibration verification of the HRGC/HRMS system by the analysis of specific calibration verification standard(s). Form VII is required for each 12-hour time period. The Contractor shall analyze the calibration verification standards and meet all criteria outlined in Exhibit D for the minimum RR and RRF and maximum Percent Difference between an initial calibration and CCVs.

3.4.9.2 Instructions

Complete the header information according to the instructions in Section 3.3. Complete the remainder of the form using the following instructions.

3.4.9.2.1 Enter the date and time of the CCV in the "DATE ANALYZED" and in the "TIME ANALYZED" fields and the date(s) and times of the initial calibration standards in the "INIT. CALIB. DATE(S)" and in the "INIT. CALIB. TIME(S)" fields,(give inclusive dates if the initial calibration is performed over more than one date). Dates shall be entered as MM/DD/YYYY. Times shall be reported in military time.

3.4.9.2.2 Complete the "GC COLUMN" and "ID" fields.

3.4.9.2.3 Using the appropriate initial calibration, enter the $\overline{RR}$ or $\overline{RRF}$ and Relative Retention Time (RRT) for each toxic congener, labeled compound, cleanup standard, and internal standard. If analysis of all 209 congeners is required, using the appropriate initial calibration, enter the RRF and RRT for each relative congener.

3.4.9.2.4 For Toxic/LOC CB Congeners, labeled compounds, cleanup standards, and internal standards, use Form VII CB-1 and CB-2 to report the concentration and the IAR data for the CCV standard analysis. Calculate the Percent Difference for all toxic/LOC congeners, labeled compounds, cleanup standards, and internal standards in the calibration standards. For all native congeners analysis, use Form VII CB-3 to CB-6 report the RRF data, the Ion Ratio, and the RRT data for the continuing calibration verification standard analysis. Calculate the Percent Difference for all native congeners in the calibration standard. Report the test (see Exhibit D, Table 5) and found concentration of each toxic, LOC, and labeled congeners. Calculate the Percent Recovery ("CONC TEST"/"CONC FOUND") for each toxic, LOC and labeled congeners. See Exhibit D - Analytical Methods for CB Congeners, for equations. Flag any data outside the QC limits.

3.4.10 CB Congener Analytical Sequence (Form VIII CB-1)

3.4.10.1 Purpose

This form is used to report the analytical sequence for CB congener analyses. At least one form is required for each GC column used for CB congener analyses.

3.4.10.2 Instructions

Complete the header information according to the instructions in Section 3.3. Complete the remainder of the form using the following instructions.

3.4.10.2.1 Enter the date(s) of the initial calibration. Give inclusive dates if the initial calibration is performed over more than one day. Dates shall be entered as MM/DD/YYYY.

3.4.10.2.2 Identify the GC column and internal diameter in the appropriate fields.

3.4.10.2.3 For every analysis associated with a particular analytical sequence starting with the initial calibration, enter the EPA Sample Number, Laboratory File Identifier, and date and time of analysis. Each sample analyzed as part of the sequence shall be reported on Form VIII **even** if it is not associated with the SDG. The Contractor shall use ZZZZZ as the EPA Sample Number to distinguish all samples that are not part of the SDG being reported.

3.4.10.2.4 If more than a single copy of Form VIII is required for CB congeners, enter the same header information on all subsequent pages for that GC column and instrument, and number each page as described in Section 3.3.

3.5 CB Congener Sample Log-In Sheet [Form DC-1]

This form documents the receipt and inspection of sample containers and samples. One original of Form DC-1 is required for each sample shipping container. If the samples in a single sample shipping container must be assigned to more than one SDG, the original Form DC-1 shall be placed with the deliverables for the lowest alpha numeric SDG number, and a copy of Form DC-1 must be placed with the deliverables for the other SDG(s). The copies should be identified as "copy(ies)", and the location of the original should be noted on the copies.

3.5.1 Sign and date the airbill (if present). Examine the shipping container and record the presence/absence of custody seals and their condition (e.g., intact, broken) in Item 1 of Form DC-1. Record the custody seal numbers in Item 2.

3.5.2 Open the container, remove the enclosed sample documentation, and record the presence/absence of Chain of Custody Records/Traffic Reports, packing lists, and airbills or airbill stickers in Items 3-5. Specify if there is an airbill present or an airbill sticker in Item 5. Record the airbill or sticker number in Item 6.

3.5.3 Remove the samples from the shipping container(s), examine the samples and the sample tags (if present), and record the condition of the sample bottles (e.g., intact, broken, leaking) and presence or absence of sample tags in Items 7 and 8.

3.5.4 Review the sample shipping documents and complete the header information as described in Section 3.3. Report the temperature of the cooler under Item 9. Compare the information recorded on all the documents and samples and circle the appropriate answer in Item 10.

3.5.5 If there are no problems observed during sample receipt, sign and date (include time) Form DC-1, and the Chain of Custody Record/Traffic Report, and write the Sample Numbers on Form DC-1. Record the appropriate sample tags and assigned laboratory numbers, if applicable. The log-in date should be recorded at the top of Form DC-1 and the date and time of cooler receipt at the laboratory should be recorded in Items 11 and 12. Record the specific area designation (e.g., refrigerator number) in the Sample Transfer block located in the bottom left corner of Form DC-1. Sign and date the Sample Transfer block. Cross out unused columns and spaces.

3.5.6 If there are problems observed during sample receipt or an answer marked with an asterisk (e.g., "absent*") was circled, contact the Task Order Project Officer (TOPO) and document the contact and the resolution of the problem on a Communication Log. Following resolution, sign and date the forms as specified in the preceding paragraph and note, where appropriate, the resolution of the problem.

3.6 CB Congeners Complete SDG File (CSF) Inventory Sheet [Form DC-2]

This form is used to record the inventory of the CSF documents and the count of documents in the original Sample Data Package that is sent to the TOPO.

3.6.1 Organize all CSF documents, as described in Section 2. Assemble the documents in the order specified on Form DC-2 and Section 2, and stamp each page with a consecutive number. (Do not number the DC-2 form.) Inventory the CSF by reviewing the document numbers and recording page number ranges in the columns provided in the Form DC-2. If there are no documents for a specific document type, enter "NA" in the empty space.

3.6.2 Certain laboratory-specific documents related to the CSF may not fit into a clearly-defined category. The laboratory should review Form DC-2 to determine if it is most appropriate to place them under Item 5, 6, 7, or 8. Item 8 should be used if there is no appropriate previous item. These types of documents should be described or listed in the blanks under each appropriate item.

4.0 DATA REPORTING FORMS

The data reporting forms are shown on the following pages.

1A - FORM I CB-1
TOXIC CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	SELECTED IONS	PEAK RT	ION RATIO	CONCENTRATION	Q
77	290/292				
81	290/292				
105	326/328				
114	326/328				
118	326/328				
123	326/328				
126	326/328				
156/157	360/362				
167	360/362				
169	360/362				
189	394/396				

LABELED CONGENER	SELECTED IONS	PEAK RT	ION RATIO	ION RATIO LIMITS	%REC	%REC LIMITS
77L	302/304			0.65 - 0.89		25 - 150
81L	302/304			0.65 - 0.89		25 - 150
105L	338/340			1.32 - 1.78		25 - 150
114L	338/340			1.32 - 1.78		25 - 150
118L	338/340			1.32 - 1.78		25 - 150
123L	338/340			1.32 - 1.78		25 - 150
126L	338/340			1.32 - 1.78		25 - 150
156L/157L	372/374			1.05 - 1.43		25 - 150
167L	372/374			1.05 - 1.43		25 - 150
169L	372/374			1.05 - 1.43		25 - 150
189L	406/408			0.89 - 1.21		25 - 150

1B - FORM I CB-2
TOXIC CB CONGENER TOXICITY
EQUIVALENCE SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	TEF	TEF-ADJUSTED CONCENTRATION
77		x 0.0001 =	
81		x 0.0001 =	
105		x 0.0001 =	
114		x 0.0005 =	
118		x 0.0001 =	
123		x 0.0001 =	
126		x 0.1 =	
156/157		x 0.0005 =	
167		x 0.00001 =	
169		x 0.01 =	
189		x 0.0001 =	
		Total TEF =	

1C - FORM I CB-3
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		

Page ___ of ___

1C - FORM I CB-3 (CON'T)
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
31		
32		
33		
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		

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1C - FORM I CB-3 (CON'T)
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
61		
62		
63		
64		
65		
66		
67		
68		
69		
70		
71		
72		
73		
74		
75		
76		
78		
79		
80		
82		
83		
84		
85		
86		
87		
88		
89		
90		

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1C - FORM I CB-3 (CON'T)
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
91		
92		
93		
94		
95		
96		
97		
98		
99		
100		
101		
102		
103		
104		
106		
107		
108		
109		
110		
111		
112		
113		
115		
116		
117		
119		
120		

Page ___ of ___

1C - FORM I CB-3 (CON'T)
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
121		
122		
124		
125		
127		
128		
129		
130		
131		
132		
133		
134		
135		
136		
137		
138		
139		
140		
141		
142		
143		
144		
145		
146		
147		
148		
149		
150		

Page ___ of ___

1C - FORM I CB-3 (CON'T)
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
151		
152		
153		
154		
155		
158		
159		
160		
161		
162		
163		
164		
165		
166		
168		
170		
171		
172		
173		
174		
175		
176		
177		
178		
179		
180		
181		
182		

Page ___ of ___

1C - FORM I CB-3 (CON'T)
CB CONGENER SAMPLE
DATA SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

TARGET ANALYTE	CONCENTRATION	Q
183		
184		
185		
186		
187		
188		
190		
191		
192		
193		
194		
195		
196		
197		
198		
199		
200		
201		
202		
203		
204		
205		
206		
207		
208		
209		

Page ___ of ___

2A - FORM II CB-1
CB CONGENER TOTAL HOMOLOGUE
CONCENTRATION SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

HOMOLOGUE	PEAKS	CONCENTRATION	Q
Total MonoCB			
Total DiCB			
Total TriCB			
Total TetraCB			
Total PentaCB			
Total HexaCB			
Total HeptaCB			
Total OctaCB			
Total NonaCB			
Decachlorobiphenyl			
Total PCBs			

4A - FORM IV CB-1
CB CONGENER METHOD BLANK SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

MATRIX: (SOIL/WATER/ASH/TISSUE/OIL) _____ LAB SAMPLE ID: _____

SAMPLE wt/vol: _____ (g/ml) _____ LAB FILE ID: _____

DECANTED (Y/N): _____ EXTRACTION (TYPE): _____ DATE RECEIVED: _____

CONCENTRATED EXTRACT VOLUME: _____(uL) DATE EXTRACTED: _____

INJECTION VOLUME: ____(uL) CLEANUP (TYPE): _____ DATE ANALYZED: _____

GC COLUMN: _____ ID: _____ (mm) DILUTION FACTOR: _____

CONCENTRATION UNITS: (pg/L or ng/kg) _____ % SOLIDS/LIPIDS: _____

EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED

5A - FORM V CB-1
CB CONGENER DESCRIPTOR SWITCHING
RESOLUTION SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) LAB FILE ID: _____

INSTRUMENT ID: _____ DATE ANALYZED: _____

TIME ANALYZED: _____

	LEVEL OF CHLORINATION	RT FIRST ELUTING	RT LAST ELUTING
01			
02			
03			
04			
05			
06			
07			
08			
09			

5B - FORM V CB-2
CB CONGENER ION ABUNDANCE
RATIO SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) LAB FILE ID: _____

INSTRUMENT ID: _____ DATE ANALYZED: _____

TIME ANALYZED: _____

TARGET ANALYTE	ION ABUNDANCE RATIO[1]	ION RATIO LIMITS	S/N (≥10)
1		2.66 - 3.60	
3		2.66 - 3.60	
4		1.33 - 1.79	
15		1.33 - 1.79	
19		0.88 - 1.20	
37		0.88 - 1.20	
54		0.65 - 0.89	
77		0.65 - 0.89	
81		0.65 - 0.89	
104		1.32 - 1.78	
105		1.32 - 1.78	
114		1.32 - 1.78	
118		1.32 - 1.78	
123		1.32 - 1.78	
126		1.32 - 1.78	
155		1.05 - 1.43	
156		1.05 - 1.43	
157		1.05 - 1.43	
167		1.05 - 1.43	
169		1.05 - 1.43	
188		0.89 - 1.21	
189		0.89 - 1.21	
202		0.76 - 1.02	
205		0.76 - 1.02	
206		0.65 - 0.89	
208		0.65 - 0.89	
209		0.99 - 1.33	

[1] Column to be used to flag IAR values outside QC limits.
S/N ratio must be greater or equal to 10.

5C - FORM V CB-3
CB CONGENER (LABELED) ION ABUNDANCE RATIO SUMMARY

EPA SAMPLE NO.

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) LAB FILE ID: _____

INSTRUMENT ID: _____ DATE ANALYZED: _____

TIME ANALYZED: _____

LABELED CONGENER	ION ABUNDANCE RATIO[1]	ION RATIO LIMITS	ION ABUNDANCE RATIO[1]
1L		2.66 - 3.60	
3L		2.66 - 3.60	
4L		1.33 - 1.79	
15L		1.33 - 1.79	
19L		0.88 - 1.20	
37L		0.88 - 1.20	
54L		0.65 - 0.89	
77L		0.65 - 0.89	
81L		0.65 - 0.89	
104L		1.32 - 1.78	
105L		1.32 - 1.78	
114L		1.32 - 1.78	
118L		1.32 - 1.78	
123L		1.32 - 1.78	
126L		1.32 - 1.78	
155L		1.05 - 1.43	
156L		1.05 - 1.43	
157L		1.05 - 1.43	
167L		1.05 - 1.43	
169L		1.05 - 1.43	
188L		0.89 - 1.21	
189L		0.89 - 1.21	
202L		0.76 - 1.02	
205L		0.76 - 1.02	
206L		0.65 - 0.89	
208L		0.65 - 0.89	
209L		0.99 - 1.03	
LABELED CLEANUP			
28L		0.88 - 1.20	
111L		1.32 - 1.78	
178L		0.89 - 1.21	
INTERNAL STANDARDS			
9L		1.33 - 1.79	
52L		0.65 - 0.89	
101L		1.32 - 1.78	
138L		1.05 - 1.43	
194L		0.76 - 1.02	

[1] Column to be used to flag IAR values outside QC limits.
S/N ratio must be greater or equal to 10.

6A - FORM VI CB-1
TOXIC/LOC CB CONGENER INITIAL CALIBRATION RESPONSE
FACTOR SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF						$\overline{RR}/\overline{RRF}$	%RSD (≤20)	RRT	QC LIMITS *
	CS 0.2	CS 1	CS 2	CS 3	CS 4	CS 5				
1										
3										
4										
15										
19										
37										
54										
77										
81										
104										
105										
114										
118										
123										
126										
155										
156										
157										
167										
169										
188										
189										
202										
205										
206										
208										
209										

* Limits should be based on ±0.5% of the RRT determined from initial calibration.

6B - FORM VI CB-2
TOXIC/LOC CB CONGENER (LABELED) INITIAL CALIBRATION
ION ABUNDANCE RATIO SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

LABELED CONGENER	ION ABUNDANCE RATIOS						IONS	FLAG	ION RATIO LIMITS
	CS	CS 1	CS 2	CS 3	CS 4	CS 5			
1L							200/202		2.66 - 3.60
3L							200/202		2.66 - 3.60
4L							234/236		1.33 - 1.79
15L							234/236		1.33 - 1.79
19L							268/270		0.88 - 1.20
37L							268/270		0.88 - 1.20
54L							302/304		0.65 - 0.89
77L							302/304		0.65 - 0.89
81L							302/304		0.65 - 0.89
104L							338/340		1.32 - 1.78
105L							338/340		1.32 - 1.78
114L							338/340		1.32 - 1.78
118L							338/340		1.32 - 1.78
123L							338/340		1.32 - 1.78
126L							338/340		1.32 - 1.78
155L							372/374		1.05 - 1.43
156L							372/374		1.05 - 1.43
157L							372/374		1.05 - 1.43
167L							372/374		1.05 - 1.43
169L							372/374		1.05 - 1.43
188L							406/408		0.89 - 1.21
189L							406/408		0.89 - 1.21
202L							440/442		0.76 - 1.02
205L							440/442		0.76 - 1.02
206L							474/476		0.65 - 0.89
208L							474/476		0.65 - 0.89
209L							508/510		0.99 - 1.03
LABELED CLEANUP									
28L							268/270		0.88 - 1.20
111L							338/340		1.32 - 1.78
178L							406/408		0.89 - 1.21
INTERNAL STANDARDS									
9L							234/236		1.33 - 1.79
52L							302/304		0.65 - 0.89
101L							338/340		1.32 - 1.78
138L							372/374		1.05 - 1.43
194L							440/442		0.76 - 1.02

6C - FORM VI CB-3
INDIVIDUAL CONGENER INITIAL CALIBRATION RESPONSE
FACTOR SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRF	ION RATIO	ION FLAG	ION RATIO LIMITS	RRT	RRT QC LIMIT*
2				2.66 - 3.60		
5				1.33 - 1.79		
6				1.33 - 1.79		
7				1.33 - 1.79		
8				1.33 - 1.79		
9				1.33 - 1.79		
10				1.33 - 1.79		
11				1.33 - 1.79		
12				1.33 - 1.79		
13				1.33 - 1.79		
14				1.33 - 1.79		
16				0.88 - 1.20		
17				0.88 - 1.20		
18				0.88 - 1.20		
20				0.88 - 1.20		
21				0.88 - 1.20		
22				0.88 - 1.20		
23				0.88 - 1.20		
24				0.88 - 1.20		
25				0.88 - 1.20		
26				0.88 - 1.20		
27				0.88 - 1.20		
28				0.88 - 1.20		
29				0.88 - 1.20		
30				0.88 - 1.20		
31				0.88 - 1.20		
32				0.88 - 1.20		
33				0.88 - 1.20		
34				0.88 - 1.20		
35				0.88 - 1.20		
36				0.88 - 1.20		
38				0.88 - 1.20		
39				0.88 - 1.20		
40				0.65 - 0.89		
41				0.65 - 0.89		
42				0.65 - 0.89		

* QC limits for RRT should be ±0.5% of the mean RRT determined from the initial calibration.

Page ___ of ___

6C - FORM VI CB-3 (CON'T)
INDIVIDUAL CONGENER INITIAL CALIBRATION RESPONSE
FACTOR SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRF	ION RATIO	ION FLAG	ION RATIO LIMITS	RRT	RRT QC LIMIT*
43				0.65 - 0.89		
44				0.65 - 0.89		
45				0.65 - 0.89		
46				0.65 - 0.89		
47				0.65 - 0.89		
48				0.65 - 0.89		
49				0.65 - 0.89		
50				0.65 - 0.89		
51				0.65 - 0.89		
52				0.65 - 0.89		
53				0.65 - 0.89		
55				0.65 - 0.89		
56				0.65 - 0.89		
57				0.65 - 0.89		
58				0.65 - 0.89		
59				0.65 - 0.89		
60				0.65 - 0.89		
61				0.65 - 0.89		
62				0.65 - 0.89		
63				0.65 - 0.89		
64				0.65 - 0.89		
65				0.65 - 0.89		
66				0.65 - 0.89		
67				0.65 - 0.89		
68				0.65 - 0.89		
69				0.65 - 0.89		
70				0.65 - 0.89		
71				0.65 - 0.89		
72				0.65 - 0.89		
73				0.65 - 0.89		
74				0.65 - 0.89		
75				0.65 - 0.89		
76				0.65 - 0.89		
78				0.65 - 0.89		
79				0.65 - 0.89		
80				0.65 - 0.89		

* QC limits for RRT should be ±0.5% of the mean RRT determined from the initial calibration.

Page ___ of ___

6C - FORM VI CB-3 (CON'T)
INDIVIDUAL CONGENER INITIAL CALIBRATION RESPONSE
FACTOR SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRF	ION RATIO	ION FLAG	ION RATIO LIMITS	RRT	RRT QC LIMIT*
82				1.32 - 1.78		
83				1.32 - 1.78		
84				1.32 - 1.78		
85				1.32 - 1.78		
86				1.32 - 1.78		
87				1.32 - 1.78		
88				1.32 - 1.78		
89				1.32 - 1.78		
90				1.32 - 1.78		
91				1.32 - 1.78		
92				1.32 - 1.78		
93				1.32 - 1.78		
94				1.32 - 1.78		
95				1.32 - 1.78		
96				1.32 - 1.78		
97				1.32 - 1.78		
98				1.32 - 1.78		
99				1.32 - 1.78		
100				1.32 - 1.78		
101				1.32 - 1.78		
102				1.32 - 1.78		
103				1.32 - 1.78		
106				1.32 - 1.78		
107				1.32 - 1.78		
108				1.32 - 1.78		
109				1.32 - 1.78		
110				1.32 - 1.78		
111				1.32 - 1.78		
112				1.32 - 1.78		
113				1.32 - 1.78		
115				1.32 - 1.78		
116				1.32 - 1.78		
117				1.32 - 1.78		
119				1.32 - 1.78		
120				1.32 - 1.78		

* QC limits for RRT should be ±0.5% of the mean RRT determined from the initial calibration.

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6C - FORM VI CB-3 (CON'T)
INDIVIDUAL CONGENER INITIAL CALIBRATION RESPONSE
FACTOR SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRF	ION RATIO	ION FLAG	ION RATIO LIMITS	RRT	RRT QC LIMIT*
121				1.32 - 1.78		
122				1.32 - 1.78		
124				1.32 - 1.78		
125				1.32 - 1.78		
127				1.32 - 1.78		
128				1.05 - 1.43		
129				1.05 - 1.43		
130				1.05 - 1.43		
131				1.05 - 1.43		
132				1.05 - 1.43		
133				1.05 - 1.43		
134				1.05 - 1.43		
135				1.05 - 1.43		
136				1.05 - 1.43		
137				1.05 - 1.43		
138				1.05 - 1.43		
139				1.05 - 1.43		
140				1.05 - 1.43		
141				1.05 - 1.43		
142				1.05 - 1.43		
143				1.05 - 1.43		
144				1.05 - 1.43		
145				1.05 - 1.43		
146				1.05 - 1.43		
147				1.05 - 1.43		
148				1.05 - 1.43		
149				1.05 - 1.43		
150				1.05 - 1.43		
151				1.05 - 1.43		
152				1.05 - 1.43		
153				1.05 - 1.43		
154				1.05 - 1.43		
158				1.05 - 1.43		
159				1.05 - 1.43		
160				1.05 - 1.43		
161				1.05 - 1.43		
162				1.05 - 1.43		

* QC limits for RRT should be ±0.5% of the mean RRT determined from the initial calibration.

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6C - FORM VI CB-3 (CON'T)
INDIVIDUAL CONGENER INITIAL CALIBRATION RESPONSE
FACTOR SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRF	ION RATIO	ION FLAG	ION RATIO LIMITS	RRT	RRT QC LIMIT*
163				1.05 - 1.43		
164				1.05 - 1.43		
165				1.05 - 1.43		
166				1.05 - 1.43		
168				1.05 - 1.43		
170				0.89 - 1.21		
171				0.89 - 1.21		
172				0.89 - 1.21		
173				0.89 - 1.21		
174				0.89 - 1.21		
175				0.89 - 1.21		
176				0.89 - 1.21		
177				0.89 - 1.21		
178				0.89 - 1.21		
179				0.89 - 1.21		
180				0.89 - 1.21		
181				0.89 - 1.21		
182				0.89 - 1.21		
183				0.89 - 1.21		
184				0.89 - 1.21		
185				0.89 - 1.21		
186				0.89 - 1.21		
187				0.89 - 1.21		
190				0.89 - 1.21		
191				0.89 - 1.21		
192				0.89 - 1.21		
193				0.89 - 1.21		
194				0.76 - 1.02		
195				0.76 - 1.02		
196				0.76 - 1.02		
197				0.76 - 1.02		
198				0.76 - 1.02		
199				0.76 - 1.02		
200				0.76 - 1.02		
201				0.76 - 1.02		
203				0.76 - 1.02		
204				0.76 - 1.02		
207				0.69 - 0.89		

* QC limits for RRT should be ±0.5% of the mean RRT determined from the initial calibration.

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7A - FORM VII CB-1
TOXIC/LOC CB CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF	$\overline{RR}/\overline{RRF}$	%D	%D FLAG	ION RATIO	ION RATIO FLAG
1						
3						
4						
15						
19						
37						
54						
77						
81						
104						
105						
114						
118						
123						
126						
155						
156						
157						
167						
169						
188						
189						
202						
205						
206						
208						
209						

7B - FORM VII CB-2
TOXIC/LOC CB CONGENER (LABELED) CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

LABELED CONGENER	RR/RRF	$\overline{RR}/\overline{RRF}$	%D	%D FLAG	ION RATIO	ION RATIO FLAG
1L						
3L						
4L						
15L						
19L						
37L						
54L						
77L						
81L						
104L						
105L						
114L						
118L						
123L						
126L						
155L						
156L						
157L						
167L						
169L						
188L						
189L						
202L						
205L						
206L						
208L						
209L						
LABELED CLEANUP						
28L						
111L						
178L						
INTERNAL STANDARDS						
9L						
52L						
101L						
138L						
194L						

7C - FORM VII CB-3
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF	$\overline{RR}/\overline{RRF}$	%D	%D FLAG	ION RATIO	ION RATIO FLAG
2						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
16						
17						
18						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						
31						
32						
33						
34						
35						
36						
38						
39						
40						
41						
42						

Page ___ of ___

7C - FORM VII CB-3 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF	$\overline{RR}/\overline{RRF}$	%D	%D FLAG	ION RATIO	ION RATIO FLAG
43						
44						
45						
46						
47						
48						
49						
50						
51						
52						
53						
55						
56						
57						
58						
59						
60						
61						
62						
63						
64						
65						
66						
67						
68						
69						
70						
71						
72						
73						
74						
75						
76						
78						
79						
80						

Page ___ of ___

7C - FORM VII CB-3 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF	$\overline{RR}/\overline{RRF}$	%D	%D FLAG	ION RATIO	ION RATIO FLAG
82						
83						
84						
85						
86						
87						
88						
89						
90						
91						
92						
93						
94						
95						
96						
97						
98						
99						
100						
101						
102						
103						
106						
107						
108						
109						
110						
111						
112						
113						
115						
116						
117						
119						
120						
121						

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7C - FORM VII CB-3 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF	$\overline{RR}/\overline{RRF}$	%D*	%D FLAG	ION RATIO	ION RATIO FLAG
122						
124						
125						
127						
128						
129						
130						
131						
132						
133						
134						
135						
136						
137						
138						
139						
140						
141						
142						
143						
144						
145						
146						
147						
148						
149						
150						
151						
152						
153						
154						
158						
159						
160						
161						
162						
163						
164						

Page ___ of ___

7C - FORM VII CB-3 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RR/RRF	$\overline{RR}/\overline{RRF}$	%D	%D FLAG	ION RATIO	ION RATIO FLAG
165						
166						
168						
170						
171						
172						
173						
174						
175						
176						
177						
178						
179						
180						
181						
182						
183						
184						
185						
186						
187						
190						
191						
192						
193						
194						
195						
196						
197						
198						
199						
200						
201						
203						
204						
207						

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7D - FORM VII CB-4
TOXIC/LOC CB CONGENER CONTINUING
CALIBRATION TIME SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRT	RRT QC LIMITS	CONC TEST	CONC FOUND	%Rec*
1					
3					
4					
15					
19					
37					
54					
77					
81					
104					
105					
114					
118					
123					
126					
155					
156					
157					
167					
169					
188					
189					
202					
205					
206					
208					
209					

* See QC acceptance criteria in Exhibit D, Table 6.

7E - FORM VII CB-5
TOXIC/LOC CB CONGENER (LABELED) CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

LABELED CONGENER	RRT	RRT QC LIMIT	CONC. TEST	CONC. FOUND	%Rec*
1L					
3L					
4L					
15L					
19L					
37L					
54L					
77L					
81L					
104L					
105L					
114L					
118L					
123L					
126L					
155L					
156L					
157L					
167L					
169L					
188L					
189L					
202L					
205L					
206L					
208L					
209L					
LABELED CLEANUP					
28L					
111L					
178L					
INTERNAL STANDARDS					
9L					
52L					
101L					
138L					
194L					

* See QC acceptance criteria in Exhibit D, Table 6.

7F - FORM VII CB-6
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTES	RRT	RRT QC LIMIT	CONC. TEST	CONC. FOUND	%Rec*
2					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
16					
17					
18					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
38					
39					
40					

* See QC acceptance criteria in Exhibit D, Table 6.

Page ___ of _____

7F - FORM VII CB-6 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTES	RRT	RRT QC LIMIT	CONC. TEST	CONC. FOUND	%Rec*
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
55					
56					
57					
58					
59					
60					
61					
62					
63					
64					
65					
66					
67					
68					
69					
70					
71					
72					
73					
74					
75					
76					
78					

* See QC acceptance criteria in Exhibit D, Table 6.

Page ___ of ___

7F - FORM VII CB-6 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTES	RRT	RRT QC LIMIT	CONC. TEST	CONC. FOUND	%Rec*
80					
82					
83					
84					
85					
86					
87					
88					
89					
90					
91					
92					
93					
94					
95					
96					
97					
98					
99					
100					
101					
102					
103					
106					
107					
108					
109					
110					
111					
112					
113					
115					
116					
117					
119					
120					
121					

* See QC acceptance criteria in Exhibit D, Table 6.

Page ___ of ___

7F - FORM VII CB-6 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTE	RRT	RRT QC LIMIT	CONC. TEST	CONC. FOUND	%Rec*
122					
124					
125					
127					
128					
129					
130					
131					
132					
133					
134					
135					
136					
137					
138					
139					
140					
141					
142					
143					
144					
145					
146					
147					
148					
149					
150					
151					
152					
153					
154					
158					
159					
160					
161					
162					
163					

* See QC acceptance criteria in Exhibit D, Table 6.

Page ___ of ___

7F - FORM VII CB-6 (CON'T)
INDIVIDUAL CONGENER CONTINUING
CALIBRATION SUMMARY

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

LAB FILE ID: _____ DATE ANALYZED: _____

INIT. CALIB. DATE(S): _____ _____ TIME ANALYZED: _____

INIT. CALIB. TIME(S): _____ _____

TARGET ANALYTES	RRT	RT	CONC. TEST	CONC. FOUND	%Rec*
164					
165					
166					
168					
170					
171					
172					
173					
174					
175					
176					
177					
178					
179					
180					
181					
182					
183					
184					
185					
186					
187					
190					
191					
192					
193					
194					
195					
196					
197					
198					
199					
200					
201					
203					
204					
207					

* See QC acceptance criteria in Exhibit D, Table 6.

Page ___ of ___

8A - FORM VIII CB
CB CONGENER ANALYTICAL SEQUENCE

LAB NAME: _____ CONTRACT: _____

LAB CODE: _____ CASE NO.: _____ TO NO.: _____ SDG NO.: _____

GC COLUMN: _____ ID: _____ (mm) INSTRUMENT ID: _____

INIT. CALIB. DATE(S): _____ _____

INIT. CALIB. TIME(S): _____ _____

THE ANALYTICAL SEQUENCE OF BLANKS, SAMPLES, STANDARDS, METHODS, and LCSs IS GIVEN BELOW:

	EPA SAMPLE NO.	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
01				
02				
03				
04				
05				
06				
07				
08				
09				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				

Page ___ of ___

CB CONGENER
SAMPLE LOG-IN SHEET (DC-1)

Lab Name					Page ____ of _____
Received By (Print Name)					Log-in Date
Received By (Signature)					
Contract No.					TO No.
Case No.		Sample Delivery Group No.			
Remarks:			Corresponding		Remarks: Condition of Sample Shipment, etc.
		EPA Sample #	Sample Tag #	Assigned Lab #	
1. Custody Seal(s)	Present/Absent* Intact/Broken				
2. Custody Seal Nos.	_____ _____				
3. Chain of Custody Records	Present/Absent*				
4. Traffic Reports or Packing Lists	_____ _____				
5. Airbill	Airbill/Sticker Present/Absent*				
6. Airbill No.	_____ _____				
7. Sample Tags	Present/Absent*				
Sample Tag Numbers	Listed/Not Listed on Chain of Custody Record				
8. Sample Condition	Intact/Broken*/ Leaking				
9. Cooler Temperature	_____				
10. Does information on custody records and sample tags agree?	Yes/No*				
11. Date Received at Laboratory	_____				
12. Time Received	_____				
Sample Transfer					
Fraction	Fraction				
Area #	Area #				
By	By				
On	On				

* Contact SMO and attach record of resolution.

Reviewed By	Logbook No.
Date	Logbook Page No.

CB CONGENER COMPLETE SDG FILE (CSF) INVENTORY SHEET (DC-2)

LABORATORY NAME _____

CITY/STATE _____

CASE NO. _____ SDG NO. _____ SDG NOS. TO FOLLOW _____ _____ _____

TASK ORDER NO. _____

CONTRACT NO. _____

SOW NO. _____

All documents delivered in the Complete SDG File must be original documents where possible. (Reference - Exhibit B Section 2.6)

		PAGE NOs.		CHECK	
		FROM	TO	LAB	EPA
1.	**Inventory Sheet** (DC-2) (Do not number)				
2.	**SDG Narrative**				
3.	**Traffic Report**				
4.	**CB Congener Data**				
	a. Sample Data				
	Toxic CB Congener Data Summary (FORM I CB-1)				
	Toxic CB Congener Toxicity Equivalence Summary (FORM I CB-2)				
	CB Congener Sample Data Summary (FORM I CB-3)				
	Selected Ion Current Profile (SICP) for each sample				
	Quantitation Reports and Area Summaries				
	Total Homologue Concentration Summary (FORM II CB)				
	b. Quality Control Data				
	Method Blank Summary (FORM IV CB)				
	CB Congner Descriptor Switching Resolution Summary (FORM V CB-1)				
	CB Congener Ion Abundance Ratio Summary (FORM V CB-2)				
	CB Congener (Labeled) Ion Abundance Ratio Summary (FORM V CB-3)				
	Analytical Sequence Summary (FORM VIII CB)				
	c. Calibration Data				
	Toxic CB Congener Initial Calibration Response Factor Summary (FORM VI CB-1)				
	Toxic CB Congener Initial Calibration Ion Abundance Ratio Summary (VI CB-2)				
	CB Congener Initial Calibration Response Factor Summary (FORM VI CB-3)				
	CB Congener Initial Calibration Ion Abundance Ratio Summary (VI CB-4)				
	Toxic CB Congener Continuing Calibration Summary (VII CB-1)				
	Toxic CB Congener Continuing Calibration Retention Time Summary (VII CB-2)				
	CB Congener Continuing Calibration Summary (VII CB-3)				
	CB Congener Continuing Calibration Retention Time Summary (VII CB-4)				

CASE NO. _____ SDG NO. _____ SDG NOS. TO FOLLOW _____

_____ _____ MOD. REF. NO. _____

	PAGE NOs.		CHECK	
	FROM	TO	LAB	EPA
d. Raw Quality Control Data				
Blank Data FORM I CB-1, CB-2, CB-3 (if applicable)	____	____	____	____
Blank Data including SICPs, Quantitation Reports, and Area Summaries for each blank analyzed	____	____	____	____

5. **Comments:** _____

Completed by:

(CLP Lab) _____ _____ _____
(Signature) (Print Name & Title) (Date)

Audited by:

(USEPA) _____ _____ _____
(Signature) (Print Name & Title) (Date)

EXHIBIT C

TARGET COMPOUND LIST (TCL)
AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)
FOR CHLORINATED BIPHENYL (CB) CONGENERS

Exhibit C - Target Compound List and Contract Required Quantitation Limits for Chlorinated Biphenyl (CBs) Congeners

Table of Contents

1.0 CHLORINATED BIPHENYL CONGENERS TARGET COMPOUND LIST (TCL) AND CONTRACT REQUIRED QUANTITATION LIMITS (CRQLs)

Table 1. CB Congener Names and CAS Numbers

CB Congener[1]	Congener Number	CAS Registry Number
2-MoCB	1	2051-60-7
3-MoCB	2	2051-61-8
4-MoCB	3	2051-62-9
2,2'-DiCB	4	13029-08-8
2,3-DiCB	5	16605-91-7
2,3'-DiCB	6	25569-80-6
2,4-DiCB	7	33284-50-3
2,4'-DiCB[2]	8	34883-43-7
2,5-DiCB	9	34883-39-1
2,6-DiCB	10	33146-45-1
3,3'-DiCB	11	2050-67-1
3,4-DiCB	12	2974-92-7
3,4'-DiCB	13	2974-90-5
3,5-DiCB	14	34883-41-5
4,4'-DiCB	15	2050-68-2
2,2',3-TrCB	16	38444-78-9
2,2',4-TrCB	17	37680-66-3
2,2',5-TrCB[2]	18	37680-65-2
2,2',6-TrCB	19	38444-73-4
2,3,3'-TrCB	20	38444-84-7
2,3,4-TrCB	21	55702-46-0
2,3,4'-TrCB	22	38444-85-8
2,3,5-TrCB	23	55720-44-0
2,3,6-TrCB	24	55702-45-9
2,3',4-TrCB	25	55712-37-3
2,3',5-TrCB	26	38444-81-4
2,3',6-TrCB	27	38444-76-7
2,4,4'-TrCB[2]	28	7012-37-5
2,4,5-TrCB	29	15862-07-4
2,4,6-TrCB	30	35693-92-6
2,4',5-TrCB	31	16606-02-3
2,4',6-TrCB	32	38444-77-8
2',3,4-TrCB	33	38444-86-9
2',3,5-TrCB	34	37680-68-5
3,3',4-TrCB	35	37680-69-6
3,3',5-TrCB	36	38444-87-0
3,4,4'-TrCB	37	38444-90-5
3,4,5-TrCB	38	53555-66-1
3,4',5-TrCB	39	38444-88-1
2,2',3,3'-TeCB	40	38444-93-8
2,2',3,4-TeCB	41	52663-59-9
2,2',3,4'-TeCB	42	36559-22-5
2,2',3,5-TeCB	43	70362-46-8
2,2',3,5'-TeCB[2]	44	41464-39-5
2,2',3,6-TeCB	45	70362-45-7
2,2',3,6'-TeCB	46	41464-47-5
2,2',4,4'-TeCB	47	2437-79-8

Table 1. CB Congener Names and CAS Numbers (Con't)

CB Congener[1]	Congener Number	CAS Registry Number
2,2',4,5-TeCB	48	70362-47-9
2,2',4,5'-TeCB	49	41464-40-8
2,2',4,6-TeCB	50	62796-65-0
2,2',4,6'-TeCB	51	68194-04-7
2,2',5,5'-TeCB[2]	52	35693-99-3
2,2',5,6'-TeCB	53	41464-41-9
2,2',6,6'-TeCB	54	15968-05-5
2,3,3',4'-TeCB	55	74338-24-2
2,3,3',4'-TeCB	56	41464-43-1
2,3,3',5-TeCB	57	70424-67-8
2,3,3',5'-TeCB	58	41464-49-7
2,3,3',6-TeCB	59	74472-33-6
2,3,4,4'-TeCB	60	33025-41-1
2,3,4,5-TeCB	61	33284-53-6
2,3,4,6-TeCB	62	54230-22-7
2,3,4',5-TeCB	63	74472-34-7
2,3,4',6-TeCB	64	52663-58-8
2,3,5,6-TeCB	65	33284-54-7
2,3',4,4'-TeCB[2]	66	32598-10-0
2,3',4,5-TeCB	67	73575-53-8
2,3',4,5'-TeCB	68	73575-52-7
2,3',4,6-TeCB	69	60233-24-1
2,3',4',5-TeCB	70	32598-11-1
2,3',4',6-TeCB	71	41464-46-4
2,3',5,5'-TeCB	72	41464-42-0
2,3',5',6-TeCB	73	74338-23-1
2,4,4',5-TeCB	74	32690-93-0
2,4,4',6-TeCB	75	32598-12-2
2',3,4,5-TeCB	76	70362-48-0
3,3',4,4'-TeCB[2,3]	77	32598-13-3
3,3',4,5-TeCB	78	70362-49-1
3,3',4,5'-TeCB	79	41464-48-6
3,3',5,5'-TeCB	80	33284-52-5
3,4,4',5-TeCB[3]	81	70362-50-4
2,2',3,3',4-PeCB	82	52663-62-4
2,2',3,3',5-PeCB	83	60145-20-2
2,2',3,3',6-PeCB	84	52663-60-2
2,2',3,4,4'-PeCB	85	65510-45-4
2,2',3,4,5-PeCB	86	55312-69-1
2,2',3,4,5'-PeCB	87	38380-02-8
2,2',3,4,6-PeCB	88	55215-17-3
2,2',3,4,6'-PeCB	89	73575-57-2
2,2',3,4',5-PeCB	90	68194-07-0
2,2',3,4',6-PeCB	91	68194-05-8
2,2',3,5,5'-PeCB	92	52663-61-3
2,2',3,5,6-PeCB	93	73575-56-1
2,2',3,5,6'-PeCB	94	73575-55-0
2,2',3,5',6-PeCB	95	38379-99-6
2,2',3,6,6'-PeCB	96	73575-54-9
2,2',3',4,5-PeCB	97	41464-51-1

Table 1. CB Congener Names and CAS Numbers (Con't)

CB Congener[1]	Congener Number	CAS Registry Number
2,2',3',4,6-PeCB	98	60233-25-2
2,2',4,4',5-PeCB	99	38380-01-7
2,2',4,4',6-PeCB	100	39485-83-1
2,2',4,5,5'-PeCB[2]	101	37680-73-2
2,2',4,5,6'-PeCB	102	68194-06-9
2,2',4,5,'6-PeCB	103	60145-21-3
2,2',4,6,6'-PeCB	104	56558-16-8
2,3,3',4,4'-PeCB[2,3]	105	32598-14-4
2,3,3',4,5-PeCB	106	70424-69-0
2,3,3',4',5-PeCB	107	70424-68-9
2,3,3',4,5'-PeCB	108	70362-41-3
2,3,3',4,6-PeCB	109	74472-35-8
2,3,3',4',6-PeCB	110	38380-03-9
2,3,3',5,5'-PeCB	111	39635-32-0
2,3,3',5,6-PeCB	112	74472-36-9
2,3,3',5',6-PeCB	113	68194-10-5
2,3,4,4',5-PeCB[3]	114	74472-37-0
2,3,4,4',6-PeCB	115	74472-38-1
2,3,4,5,6-PeCB	116	18259-05-7
2,3,4',5,6-PeCB	117	68194-11-6
2,3',4,4',5-PeCB[2,3]	118	31508-00-6
2,3',4,4',6-PeCB	119	56558-17-9
2,3',4,5,5'-PeCB	120	68194-12-7
2,3',4,5,'6-PeCB	121	56558-18-0
2',3,3',4,5-PeCB	122	76842-07-4
2',3,4,4',5-PeCB[3]	123	65510-44-3
2',3,4,5,5'-PeCB	124	70424-70-3
2',3,4,5,6'-PeCB	125	74472-39-2
3,3',4,4',5-PeCB[2,3]	126	57465-28-8
3,3',4,5,5'-PeCB	127	39635-33-1
2,2',3,3',4,4'-HxCB[2]	128	38380-07-3
2,2',3,3',4,5-HxCB	129	55215-18-4
2,2',3,3',4,5'-HxCB	130	52663-66-8
2,2',3,3',4,6-HxCB	131	61798-70-7
2,2',3,3',4,6'-HxCB	132	38380-05-1
2,2',3,3',5,5'-HxCB	133	35694-04-3
2,2',3,3',5,6-HxCB	134	52704-70-8
2,2',3,3',5,6'-HxCB	135	52744-13-5
2,2',3,3',6,6'-HxCB	136	38411-22-2
2,2',3,4,4',5-HxCB	137	35694-06-5
2,2',3,4,4',5'-HxCB[2]	138	35065-28-2
2,2',3,4,4',6-HxCB	139	56030-56-9
2,2',3,4,4',6'-HxCB	140	59291-64-4
2,2',3,4,5,5'-HxCB	141	52712-04-6
2,2',3,4,5,6-HxCB	142	41411-61-4
2,2',3,4,5,6'-HxCB	143	68194-15-0
2,2',3,4,5',6-HxCB	144	68194-14-9
2,2',3,4,6,6'-HxCB	145	74472-40-5
2,2',3,4',5,5'-HxCB	146	51908-16-8
2,2',3,4',5,6-HxCB	147	68194-13-8

Table 1. CB Congener Names and CAS Numbers (Con't)

CB Congener[1]	Congener Number	CAS Registry Number
2,2',3,4',5,6'-HxCB	148	74472-41-6
2,2',3,4',5',6-HxCB	149	38380-04-0
2,2',3,4',6,6'-HxCB	150	68194-08-1
2,2',3,5,5',6-HxCB	151	52663-63-5
2,2',3,5,6,6'-HxCB	152	68194-09-2
2,2',4,4',5,5'-HxCB[2]	153	35065-27-1
2,2',4,4',5',6-HxCB	154	60145-22-4
2,2',4,4',6,6'-HxCB	155	33979-03-2
2,3,3',4,4',5-HxCB[3]	156	38380-08-4
2,3,3',4,4',5'-HxCB[3]	157	69782-90-7
2,3,3',4,4',6-HxCB	158	74472-42-7
2,3,3',4,5,5'-HxCB	159	39635-35-3
2,3,3',4,5,6-HxCB	160	41411-62-5
2,3,3',4,5',6-HxCB	161	74472-43-8
2,3,3',4',5,5'-HxCB	162	39635-34-2
2,3,3',4',5,6-HxCB	163	74472-44-9
2,3,3',4',5',6-HxCB	164	74472-45-0
2,3,3',5,5',6-HxCB	165	74472-46-1
2,3,4,4',5,6-HxCB	166	41411-63-6
2,3',4,4',5,5'-HxCB[3]	167	52663-72-6
2,3',4,4',5',6-HxCB	168	59291-65-5
3,3',4,4',5,5'-HxCB[2,3]	169	32774-16-6
2,2',3,3',4,4',5-HpCB[2]	170	35065-30-6
2,2'3,3',4,4',6-HpCB	171	52663-71-5
2,2',3,3',4,5,5'-HpCB	172	52663-74-8
2,2',3,3',4,5,6-HpCB	173	68194-16-1
2,2',3,3',4,5,6'-HpCB	174	38411-25-5
2,2',3,3',4,5',6-HpCB	175	40186-70-7
2,2',3,3',4,6,6'-HpCB	176	52663-65-7
2,2',3,3',4',5,6-HpCB	177	52663-70-4
2,2',3,3',5,5',6-HpCB	178	52663-67-9
2,2',3,3',5,6,6'-HpCB	179	52663-64-6
2,2',3,4,4',5,5'-HpCB[2]	180	35065-29-3
2,2',3,4,4',5,6-HpCB	181	74472-47-2
2,2',3,4,4',5,6'-HpCB	182	60145-23-5
2,2',3,4,4',5',6-HpCB	183	52663-69-1
2,2',3,4,4',6,6'-HpCB	184	74472-48-3
2,2',3,4,5,5',6-HpCB	185	52712-05-7
2,2',3,4,5,6,6'-HpCB	186	74472-49-4
2,2',3,4',5,5',6-HpCB[2]	187	52663-68-0
2,2',3,4',5,6,6'-HpCB	188	74487-85-7
2,3,3',4,4',5,5'-HpCB[3]	189	39635-31-9
2,3,3',4,4',5,6-HpCB	190	41411-64-7
2,3,3',4,4',5',6-HpCB	191	74472-50-7
2,3,3',4,5,5',6-HpCB	192	74472-51-8
2,3,3',4',5,5',6-HpCB	193	69782-91-8
2,2',3,3',4,4',5,5'-OcCB	194	35694-08-7
2,2',3,3',4,4',5,6-OcCB[2]	195	52663-78-2
2,2',3,3',4,4',5,6'-OcCB	196	42740-50-1
2,2',3,3',4,4',6,6'-OcCB	197	33091-17-7
2,2',3,3',4,5,5',6-OcCB	198	68194-17-2

Table 1. CB Congener Names and CAS Numbers (Con't)

CB Congener[1]	Congener Number	CAS Registry Number
2,2',3,3',4,5,5',6'-OcCB	199	52663-75-9
2,2',3,3',4,5,6,6'-OcCB	200	52663-73-7
2,2',3,3',4,5',6,6'-OcCB	201	40186-71-8
2,2',3,3',5,5',6,6'-OcCB	202	2136-99-4
2,2',3,4,4',5,5',6-OcCB	203	52663-76-0
2,2',3,4,4',5,6,6'-OcCB	204	74472-52-9
2,3,3',4,4',5,5',6-OcCB	205	74472-53-0
2,2',3,3',4,4',5,5',6-NoCB[2]	206	40186-72-9
2,2',3,3',4,4',5,6,6'-NoCB	207	52663-79-3
2,2',3,3',4,5,5',6,6'-NoCB	208	52663-77-1
DeCB[2]	209	2051-24-3

Table 2. CB Congener Contract Required Quantitation Limits (CRQLs)

Cl No.[4]	Congener No. [5,6]	Water (pg/L)	Other (ng/kg)	Extract (pg/µL)
		CRQL	CRQL	CRQL
Compounds using 9L ($^{13}C_{12}$-2,5-DiCB) as Labeled Internal Standard				
CB Congener				
	Monochlorobiphenyls			
1	1	200	20	10
1	2	10	1	0.5
1	3	200	20	10
	Dichlorobiphenyls			
2	4	500	50	20
2	10	50	5	2
2	9	50	5	2
2	7	50	5	2
2	6	50	5	2
2	5	50	5	2
2	8	500	50	20
2	14	100	10	5
2	11	200	20	10
2	13	100	10	5
2	12			
2	13/12			
2	15	500	50	20
	Trichlorobiphenyls			
3	19	100	10	5
3	30	500	50	20
3	18			
3	30/18			
3	17	200	20	10
3	27	200	20	10
3	24	200	20	10
3	16	100	10	5
3	32	200	20	10
3	34	200	20	10
3	23	200	20	10
3	29	200	20	10
3	26			
3	26/29			
3	25	200	20	10
3	31	500	50	20
3	28	500	50	20
3	20			
3	28/20			
3	21	200	20	10
3	33			
3	21/33			
3	22	200	20	10
3	36	200	20	10
3	39	200	20	10
3	38	200	20	10
3	35	200	20	10
3	37	500	50	20

Table 2. CB Congener Contract Required Quantitation Limits (CRQLs) (Con't)

Cl No.[4]	Congener No. [5,6]	Water (pg/L)	Other (ng/kg)	Extract (pg/µL)
		CRQL	CRQL	CRQL
Compounds using 52L ($^{13}C_{12}$-2,2',5,5'-TeCB) as Labeled Internal Standard				
CB Congener				
Tetrachlorobiphenyls				
4	54	500	50	20
4	50	200	20	10
4	53			
4	50/53			
4	45	200	20	10
4	51			
4	45/51			
4	46	200	20	10
4	52	500	50	20
4	73	500	50	20
4	43	200	20	10
4	69	500	50	20
4	49			
4	69/49			
4	48	200	20	10
4	65	500	50	20
4	47			
4	44			
4	44/47/65			
4	62	200	20	10
4	75			
4	59			
4	59/62/75			
4	42	200	20	10
4	41	500	50	20
4	71			
4	40			
4	41/40/71			
4	64	200	20	10
4	72	500	50	20
4	68	500	50	20
4	57	500	50	20
4	58	500	50	20
4	67	500	50	20
4	63	500	50	20
4	61	500	50	20
4	70			
4	76			
4	74			
4	61/70/74/76			
4	66	500	50	20
4	55	500	50	20
4	56	200	20	10
4	60	500	50	20
4	80	500	50	20
4	79	500	50	20
4	78	500	50	20

Table 2. CB Congener Contract Required Quantitation Limits (CRQLs) (Con't)

Cl No.[4]	Congener No. [5,6]	Water (pg/L)	Other (ng/kg)	Extract (pg/µL)
		CRQL	CRQL	CRQL
4	81	500	50	20
4	77	500	50	20
Compounds using 101L ($^{13}C_{12}$-2,2',4,5,5'-PeCB) as Labeled Internal Standard				
CB Congener				
Pentachlorobiphenyls				
5	104	500	50	20
5	96	500	50	20
5	103	500	50	20
5	94	500	50	20
5	95	500	50	20
5	100			
5	93			
5	102			
5	98			
5	95/100/93/102/98			
5	88	500	50	20
5	91			
5	88/91			
5	84	500	50	20
5	89	500	50	20
5	121	500	50	20
5	92	500	50	20
5	113	1000	100	50
5	90			
5	101			
5	113/90/101			
5	83	500	50	20
5	99			
5	83/99			
5	112	1000	100	50
5	119	500	50	20
5	108			
5	86			
5	97			
5	125			
5	87			
5	108/119/86/97/125/87			
5	117	200	20	10
5	116			
5	85			
5	117/116/85			
5	110	1000	100	50
5	115			
5	110/115			
5	82	500	50	20
5	111	1000	100	50
5	120	500	50	20
5	107	1000	100	50
5	124			
5	107/124			
5	109	200	20	10

Table 2. CB Congener Contract Required Quantitation Limits (CRQLs) (Con't)

Cl No.[4]	Congener No. [5,6]	Water (pg/L)	Other (ng/kg)	Extract (pg/µL)
		CRQL	CRQL	CRQL
5	123	500	50	20
5	106	500	50	20
5	118	500	50	20
5	122	500	50	20
5	114	500	50	20
5	105	200	20	10
5	127	1000	100	50
5	126	500	50	20
Compounds using 138L ($^{13}C_{12}$-2,2',3,4,4',5'-HxCB) as Labeled Internal Standard				
CB Congener				
Hexachlorobiphenyls				
6	155	1000	100	50
6	152	1000	100	50
6	150	1000	100	50
6	136	200	20	10
6	145	1000	100	50
6	148	1000	100	50
6	151	500	50	20
6	135			
6	154			
6	151/135/154			
6	144	500	50	20
6	147	500	50	20
6	149			
6	147/149			
6	134	500	50	20
6	143			
6	134/143			
6	139	500	50	20
6	140			
6	139/140			
6	131	500	50	20
6	142	1000	100	50
6	132	500	50	20
6	133	500	50	20
6	165	1000	100	50
6	146	500	50	20
6	161	1000	100	50
6	153	500	50	20
6	168			
6	153/168			
6	141	200	20	10
6	130	500	50	20
6	137	1000	100	50
6	164	500	50	20

Table 2. CB Congener Contract Required Quantitation Limits (CRQLs) (Con't)

Cl No.[4]	Congener No. [5,6]	Water (pg/L)	Other (ng/kg)	Extract (pg/µL)
		CRQL	CRQL	CRQL
6	138	500	50	20
6	163			
6	129			
6	160			
6	138/163/129/160			
6	158	200	20	10
6	166	500	50	20
6	128			
6	128/166			
6	159	1000	100	50
6	162	1000	100	50
6	167	500	50	20
6	156	500	50	20
6	157			
6	156/157			
6	169	500	50	20
Compounds using 194L($^{13}C_{12}$-2,2',3,3',4,4',5,5'-OcCB) as Labeled Internal Standard				
CB Congener				
Heptachlorobiphenyls				
7	188	500	50	20
7	179	500	50	20
7	184	1000	100	50
7	176	1000	100	50
7	186	1000	100	50
7	178	500	50	20
7	175	1000	100	50
7	187	500	50	20
7	182	1000	100	50
7	183	1000	100	50
7	185			
7	183/185			
7	174	500	50	20
7	177	500	50	20
7	181	1000	100	50
7	171	1000	100	50
7	173			
7	171/173			
7	172	1000	100	50
7	192	1000	100	50
7	193	500	50	20
7	180			
7	180/193			
7	191	1000	100	50
7	170	500	50	20
7	190	500	50	20
7	189	500	50	20

2.0 TOTAL HOMOLOGUES

Data are reported for the total concentration of all detected chlorinated biphenyl congeners in the following homologues. However, because the calculation of the total homologue concentrations is a mathematical computation, it is not possible to assign Contract Required Quantitation Limits (CRQLs) values to these values.

Homologue	CAS No.
Total Mono CB	27323-18-8
Total Di CB	25512-42-9
Total Tri CB	25323-68-6
Total Tetra CB	26914-33-0
Total Penta CB	25429-29-2
Total Hexa CB	26601-64-9
Total Hepta CB	28655-71-2
Total Octa CB	55722-26-4
Total Nona CB	53742-07-7

Homologue	Definition
Mono CB	Monochlorobiphenyl
Di CB	Dichlorobiphenyl
Tri CB	Trichlorobiphenyl
Tetra CB	Tetrachlorobiphenyl
Penta CB	Pentachlorobiphenyl
Hexa CB	Hexachlorobiphenyl
Hepta CB	Heptachlorobiphenyl
Octa CB	Octachlorobiphenyl
Nona CB	Nonachlorobiphenyl